

EQ-1-C2-1.ST25.txt
SEQUENCE LISTING

<110> Dowling, Patricia W.
Youngner, Julius S.

<120> COLD-ADAPTED EQUINE INFLUENZA VIRUSES

<130> EQ-1-C2-1

<140> 10/065,133

<141> 2002-09-19

<150> PCT/US99/18583

<151> 1999-08-12

<150> 09/133,921

<151> 1998-08-13

<160> 108

<170> PatentIn version 3.1

<210> 1

<211> 1023

<212> DNA

<213> Equine influenza virus H3N8

<220>

<221> CDS

<222> (25)..(780)

<223>

<220>

<221> misc_feature

<222> (673)..(673)

<223> At nucleotide 673, r = a or g
At amino acid residue 213, Xaa = Val

<400> 1

gcaaaagcag gtagatattt aaag atg agt ctt ctg acc gag gtc gaa acg	51
Met Ser Leu Leu Thr Glu Val Glu Thr	
1 5	

tac gtt ctc tct atc gta cca tca ggc ccc ctc aaa gcc gag atc gcg	99
Tyr Val Leu Ser Ile Val Pro Ser Gly Pro Leu Lys Ala Glu Ile Ala	
10 15 20 25	

cag aga ctt gaa gat gtc ttt gca ggg aag aac acc gat ctt gag gca	147
Gln Arg Leu Glu Asp Val Phe Ala Gly Lys Asn Thr Asp Leu Glu Ala	
30 35 40	

ctc atg gaa tgg cta aag aca aga cca atc ctg tca cct ctg act aaa	195
Leu Met Glu Trp Leu Lys Thr Arg Pro Ile Leu Ser Pro Leu Thr Lys	
45 50 55	

ggg att tta gga ttc gta ttc acg ctc acc gtg ccc agt gag cga gga	243
Gly Ile Leu Gly Phe Val Phe Thr Leu Thr Val Pro Ser Glu Arg Gly	
60 65 70	

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ctg cag cgt aga cgc ttt gtc caa aat gcc ctt agt gga aac gga gat	291
Leu Gln Arg Arg Arg Phe Val Gln Asn Ala Leu Ser Gly Asn Gly Asp	
75 80 85	
cca aac aac atg gac aga gca gta aaa ctg tac agg aag ctt aaa aga	339
Pro Asn Asn Met Asp Arg Ala Val Lys Leu Tyr Arg Lys Leu Lys Arg	
90 95 100 105	
gaa ata aca ttc cat ggg gca aaa gag gtg gca ctc agc tat tcc act	387
Glu Ile Thr Phe His Gly Ala Lys Glu Val Ala Leu Ser Tyr Ser Thr	
110 115 120	
ggg gca cta gcc agc tgc atg gga ctc ata tac aac aga atg gga act	435
Gly Ala Leu Ala Ser Cys Met Gly Leu Ile Tyr Asn Arg Met Gly Thr	
125 130 135	
gtg aca acc gaa gtg gca ttt ggc ctg gta tgc gcc aca tgt gaa cag	483
Val Thr Thr Glu Val Ala Phe Gly Leu Val Cys Ala Thr Cys Glu Gln	
140 145 150	
atc gct gat tcc cag cat cga tct cac agg cag atg gtg aca aca acc	531
Ile Ala Asp Ser Gln His Arg Ser His Arg Gln Met Val Thr Thr Thr	
155 160 165	
aac cca tta atc aga cat gaa aac aga atg gta tta gcc agt acc acg	579
Asn Pro Leu Ile Arg His Glu Asn Arg Met Val Leu Ala Ser Thr Thr	
170 175 180 185	
gct aaa gcc atg gag cag atg gca ggg tcg agt gag cag gca gca gag	627
Ala Lys Ala Met Glu Gln Met Ala Gly Ser Ser Glu Gln Ala Ala Glu	
190 195 200	
gcc atg gag gtt gct agt aag gct agg cag atg gtr cag gca atg aga	675
Ala Met Glu Val Ala Ser Lys Ala Arg Gln Met Xaa Gln Ala Met Arg	
205 210 215	
acc att ggg acc cac cct agc tcc agt gcc ggt ttg aaa gat gat ctc	723
Thr Ile Gly Thr His Pro Ser Ser Ser Ala Gly Leu Lys Asp Asp Leu	
220 225 230	
ctt gaa aat ttg cag gcc tac cag aaa cgg atg gga gtg caa atg cag	771
Leu Glu Asn Leu Gln Ala Tyr Gln Lys Arg Met Gly Val Gln Met Gln	
235 240 245	
cga ttc aag tgatcctctc gttattgcag caagtatcat tgggatcttg	820
Arg Phe Lys	
250	
cacttgatat tgtggattct tgatgcctt ttcttcaaat tcatttatcg tcgccttaaa	880
tacgggttga aaagagggcc ttctacggaa ggagtacctg agtctatgag ggaagaatat	940
cggcaggaac agcagaatgc tgtggatggt gacgatggtc attttgtcaa catagagctg	1000
gagtaaaaaa ctaccttggt tct	1023

<210> 2

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<211> 252
<212> PRT
<213> Equine influenza virus H3N8

<220>
<221> misc_feature
<222> (213)..(213)
<223> The 'Xaa' at location 213 stands for Val.

<400> 2

Met Ser Leu Leu Thr Glu Val Glu Thr Tyr Val Leu Ser Ile Val Pro
1          5          10          15

Ser Gly Pro Leu Lys Ala Glu Ile Ala Gln Arg Leu Glu Asp Val Phe
          20          25          30

Ala Gly Lys Asn Thr Asp Leu Glu Ala Leu Met Glu Trp Leu Lys Thr
          35          40          45

Arg Pro Ile Leu Ser Pro Leu Thr Lys Gly Ile Leu Gly Phe Val Phe
          50          55          60

Thr Leu Thr Val Pro Ser Glu Arg Gly Leu Gln Arg Arg Arg Phe Val
65          70          75          80

Gln Asn Ala Leu Ser Gly Asn Gly Asp Pro Asn Asn Met Asp Arg Ala
          85          90          95

Val Lys Leu Tyr Arg Lys Leu-Lys Arg Glu Ile Thr Phe His Gly Ala
          100          105          110

Lys Glu Val Ala Leu Ser Tyr Ser Thr Gly Ala Leu Ala Ser Cys Met
          115          120          125

Gly Leu Ile Tyr Asn Arg Met Gly Thr Val Thr Thr Glu Val Ala Phe
          130          135          140

Gly Leu Val Cys Ala Thr Cys Glu Gln Ile Ala Asp Ser Gln His Arg
145          150          155          160

Ser His Arg Gln Met Val Thr Thr Thr Asn Pro Leu Ile Arg His Glu
          165          170          175

Asn Arg Met Val Leu Ala Ser Thr Thr Ala Lys Ala Met Glu Gln Met
          180          185          190

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Ala Gly Ser Ser Glu Gln Ala Ala Glu Ala Met Glu Val Ala Ser Lys
195 200 205

Ala Arg Gln Met Xaa Gln Ala Met Arg Thr Ile Gly Thr His Pro Ser
210 215 220

Ser Ser Ala Gly Leu Lys Asp Asp Leu Leu Glu Asn Leu Gln Ala Tyr
225 230 235 240

Gln Lys Arg Met Gly Val Gln Met Gln Arg Phe Lys
245 250

<210> 3
<211> 756
<212> DNA
<213> Equine influenza virus H3N8

<400> 3
atgagtcttc tgaccgaggt cgaaacgtac gttctctcta tcgtaccatc aggccccctc 60
aaagccgaga tcgcgagag acttgaagat gtctttgcag ggaagaacac cgatcttgag 120
gcactcatgg aatggctaaa gacaagacca atcctgtcac ctctgactaa agggatttta 180
ggattcgtat tcacgctcac cgtgcccagt gagcgaggac tgcagcgtag acgctttgtc 240
caaaatgccc ttagtggaac cgagatcca aacaacatgg acagagcagt aaaactgtac 300
aggaagctta aaagagaaat aacattccat ggggcaaaag aggtggcact cagctattcc 360
actggtgcac tagccagctg catgggactc atatacaaca gaatgggaac tgtgacaacc 420
gaagtggcat ttggcctggt atgcgccaca tgtgaacaga tcgctgattc ccagcatcga 480
tctcacagggc agatggtgac aacaaccaac ccattaatca gacatgaaaa cagaatggta 540
ttagccagta ccacggctaa agccatggag cagatggcag ggtcgagtga gcaggcagca 600
gaggccatgg aggttgctag taaggctagg cagatggtrc aggcaatgag aaccattggg 660
accacccta gctccagtgc cggtttgaaa gatgatctcc ttgaaaattt gcaggcctac 720
cagaaacgga tgggagtgca aatgcagcga ttcaag 756

<210> 4
<211> 1023
<212> DNA
<213> Equine influenza virus H3N8

<220>
<221> CDS
<222> (25)..(780)
<223>

<400> 4

gcaaaagcag gtagatatattt aaag atg agt ctt ctg acc gag gtc gaa acg 51
Met Ser Leu Leu Thr Glu Val Glu Thr
1 5

tac gtt ctc tct atc tta cca tca ggc ccc ctc aaa gcc gag atc gcg 99
Tyr Val Leu Ser Ile Leu Pro Ser Gly Pro Leu Lys Ala Glu Ile Ala
10 15 20 25

cag aga ctt gaa gat gtc ttt gca ggg aag aac acc gat ctt gag gca 147
Gln Arg Leu Glu Asp Val Phe Ala Gly Lys Asn Thr Asp Leu Glu Ala
30 35 40

ctc atg gaa tgg cta aag aca aga cca atc ctg tca cct ctg act aaa 195
Leu Met Glu Trp Leu Lys Thr Arg Pro Ile Leu Ser Pro Leu Thr Lys
45 50 55

ggg att tta gga ttc gta ttc acg ctc acc gtg ccc agt gag cga gga 243
Gly Ile Leu Gly Phe Val Phe Thr Leu Thr Val Pro Ser Glu Arg Gly
60 65 70

ctg cag cgt aga cgc ttt gtc caa aat gcc ctt agt gga aac gga gat 291
Leu Gln Arg Arg Arg Phe Val Gln Asn Ala Leu Ser Gly Asn Gly Asp
75 80 85

cca aac aac atg gac aga gca gta aaa ctg tac agg aag ctt aaa aga 339
Pro Asn Asn Met Asp Arg Ala Val Lys Leu Tyr Arg Lys Leu Lys Arg
90 95 100 105

gaa ata aca ttc cat ggg gca aaa gag gtg gca ctc agc tat tcc act 387
Glu Ile Thr Phe His Gly Ala Lys Glu Val Ala Leu Ser Tyr Ser Thr
110 115 120

ggt gca cta gcc agc tgc atg gga ctc ata tac aac aga atg gga act 435
Gly Ala Leu Ala Ser Cys Met Gly Leu Ile Tyr Asn Arg Met Gly Thr
125 130 135

gtg aca acc gaa gtg gca ttt ggc ctg gta tgc gcc aca tgt gaa cag 483
Val Thr Thr Glu Val Ala Phe Gly Leu Val Cys Ala Thr Cys Glu Gln
140 145 150

atc gct gat tcc cag cat cga tct cac agg cag atg gtg aca ata acc 531
Ile Ala Asp Ser Gln His Arg Ser His Arg Gln Met Val Thr Ile Thr
155 160 165

aac cca tta atc aga cat gaa aac aga atg gta tta gcc agt acc acg 579
Asn Pro Leu Ile Arg His Glu Asn Arg Met Val Leu Ala Ser Thr Thr
170 175 180 185

gct aaa gcc atg gag cag atg gca ggg tcg agt gag cag gca gca gag 627
Ala Lys Ala Met Glu Gln Met Ala Gly Ser Ser Glu Gln Ala Ala Glu
190 195 200

gcc atg gag gtt gct agt aag gct agg cag atg gta cag gca atg aga 675
Ala Met Glu Val Ala Ser Lys Ala Arg Gln Met Val Gln Ala Met Arg
205 210 215

acc att ggg acc cac cct agc tcc agt gcc ggt ttg aaa gat gat ctc 723

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Thr Ile Gly Thr His Pro Ser Ser Ser Ala Gly Leu Lys Asp Asp Leu
 220 225 230

ctt gaa aat ttg cag gcc tac cag aaa cgg atg gga gtg caa atg cag 771
 Leu Glu Asn Leu Gln Ala Tyr Gln Lys Arg Met Gly Val Gln Met Gln
 235 240 245

cga ttc aag tgatcctctc gttattgcag caagtatcat tgggatcttg 820
 Arg Phe Lys
 250

cacttgatat tgtggattct tgatcgccctt ttcttcaaatt tcatttatcg tcgccttaaa 880

tacggccttga aaagaggggcc ttctacggaa ggagtacctg agtctatgag ggaagaatat 940

cggcaggaac agcagaatgc tgtggatggtt gacgatggtc attttgtcaa catagagctg 1000

gagtaaaaaa ctaccttggtt tct 1023

<210> 5
 <211> 252
 <212> PRT
 <213> Equine influenza virus H3N8

<400> 5

Met Ser Leu Leu Thr Glu Val Glu Thr Tyr Val Leu Ser Ile Leu Pro
 1 5 10 15

Ser Gly Pro Leu Lys Ala Glu Ile Ala Gln Arg Leu Glu Asp Val Phe
 20 25 30

Ala Gly Lys Asn Thr Asp Leu Glu Ala Leu Met Glu Trp Leu Lys Thr
 35 40 45

Arg Pro Ile Leu Ser Pro Leu Thr Lys Gly Ile Leu Gly Phe Val Phe
 50 55 60

Thr Leu Thr Val Pro Ser Glu Arg Gly Leu Gln Arg Arg Arg Phe Val
 65 70 75 80

Gln Asn Ala Leu Ser Gly Asn Gly Asp Pro Asn Asn Met Asp Arg Ala
 85 90 95

Val Lys Leu Tyr Arg Lys Leu Lys Arg Glu Ile Thr Phe His Gly Ala
 100 105 110

Lys Glu Val Ala Leu Ser Tyr Ser Thr Gly Ala Leu Ala Ser Cys Met
 115 120 125

EQ-1-C2-1.ST25.txt

Gly Leu Ile Tyr Asn Arg Met Gly Thr Val Thr Thr Glu Val Ala Phe
 130 135 140

Gly Leu Val Cys Ala Thr Cys Glu Gln Ile Ala Asp Ser Gln His Arg
 145 150 155 160

Ser His Arg Gln Met Val Thr Ile Thr Asn Pro Leu Ile Arg His Glu
 165 170 175

Asn Arg Met Val Leu Ala Ser Thr Thr Ala Lys Ala Met Glu Gln Met
 180 185 190

Ala Gly Ser Ser Glu Gln Ala Ala Glu Ala Met Glu Val Ala Ser Lys
 195 200 205

Ala Arg Gln Met Val Gln Ala Met Arg Thr Ile Gly Thr His Pro Ser
 210 215 220

Ser Ser Ala Gly Leu Lys Asp Asp Leu Leu Glu Asn Leu Gln Ala Tyr
 225 230 235 240

Gln Lys Arg Met Gly Val Gln Met Gln Arg Phe Lys
 245 250

<210> 6
 <211> 756
 <212> DNA
 <213> Equine influenza virus H3N8

<400> 6
 atgagtcttc tgaccgaggt cgaaacgtac gttctctcta tcttaccatc aggccccctc 60
 aaagccgaga tcgcgcagag acttgaagat gtctttgcag ggaagaacac cgatcttgag 120
 gcactcatgg aatggctaaa gacaagacca atcctgtcac ctctgactaa agggatttta 180
 ggattcgtat tcacgctcac cgtgcccagt gagcgaggac tgcagcgtag acgctttgtc 240
 caaaatgccc ttagtggaac cggagatcca aacaacatgg acagagcagt aaaactgtac 300
 aggaagctta aaagagaaat aacattccat ggggcaaaag aggtggcact cagctattcc 360
 actggtgcac tagccagctg catgggactc atatacaaca gaatgggaac tgtgacaacc 420
 gaagtggcat ttggcctggt atgcgccaca tgtgaacaga tcgctgattc ccagcatcga 480
 tctcacaggc agatggtgac aataaccaac ccattaatca gacatgaaaa cagaatggta 540
 ttagccagta ccacggctaa agccatggag cagatggcag ggtcgagtga gcaggcagca 600
 gaggccatgg aggttgctag taaggctagg cagatggtac aggcaatgag aaccattggg 660

acccacccta gctccagtgc cggtttgaaa gatgatctcc ttgaaaattt gcaggcctac 720
 cagaaacgga tgggagtgca aatgcagcga ttcaag 756

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<210> 7
<211> 1762
<212> DNA
<213> Equine influenza virus H3N8
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<220>
<221> CDS
<222> (30) .. (1724)
<223>
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<400> 7
agcaaaagca ggggatattt ctgtcaatc atg aag aca acc att att ttg ata      53
                Met Lys Thr Thr Ile Ile Leu Ile
                1               5

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cca ctg acc cat tgg gtc tac agt caa aac cca acc agt ggc aac aac      101
Pro Leu Thr His Trp Val Tyr Ser Gln Asn Pro Thr Ser Gly Asn Asn
      10                      15                      20

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aca gcc aca tta tgt ctg gga cac cat gca gta gca aat gga aca ttg 149
Thr. Ala Thr Leu Cys Leu Gly His His Ala Val Ala Asn Gly Thr Leu
25 30 35 40

gta aaa aca ata act gat gac caa att gag gtg aca aat gct act gaa 197
Val Lys Thr Ile Thr Asp Asp Gln Ile Glu Val Thr Asn Ala Thr Glu
45 50 55

tta gtt cag agc att tca ata ggg aaa ata tgc aac aac tca tat aga 245
Leu Val Gln Ser Ile Ser Ile Gly Lys Ile Cys Asn Asn Ser Tyr Arg
60 65 70

ggt cta gat gga aga aat tgc aca tta ata gat gca atg cta gga gac 293
Val Leu Asp Gly Arg Asn Cys Thr Leu Ile Asp Ala Met Leu Gly Asp
75 80 85

ccc cac tgt gat gtc ttt cag tat gag aat tgg gac ctc ttc ata gaa 341
Pro His Cys Asp Val Phe Gln Tyr Glu Asn Trp Asp Leu Phe Ile Glu
90 95 100

aga agc agc gct ttc agc agt tgc tac cca tat gac atc cct gac tat 389
Arg Ser Ser Ala Phe Ser Ser Cys Tyr Pro Tyr Asp Ile Pro Asp Tyr
105 110 115 120

gca tcg ctc cgg tcc att gta gca tcc tca gga aca ttg gaa ttc aca 437
Ala Ser Leu Arg Ser Ile Val Ala Ser Ser Gly Thr Leu Glu Phe Thr
125 130 135

gca gag gga ttc aca tgg aca ggt gtc act caa aac gga aga agt gga 485
Ala Glu Gly Phe Thr Trp Thr Gly Val Thr Gln Asn Gly Arg Ser Gly
140 145 150

tcc tgc aaa agg gga tca gcc gat agt ttc ttt agc cga ctg aat tgg 533

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Ser Cys Lys Arg Gly Ser Ala Asp Ser Phe Phe Ser Arg Leu Asn Trp	
155 160 165	
cta aca gaa tct gga aac tct tac ccc aca ttg aat gtg aca atg cct	581
Leu Thr Glu Ser Gly Asn Ser Tyr Pro Thr Leu Asn Val Thr Met Pro	
170 175 180	
aac aat aaa aat ttc gac aaa cta tac atc tgg ggg att cat cac ccg	629
Asn Asn Lys Asn Phe Asp Lys Leu Tyr Ile Trp Gly Ile His His Pro	
185 190 195 200	
agc tca aac aaa gag cag aca aaa ttg tac atc caa gaa tcg gga cga	677
Ser Ser Asn Lys Glu Gln Thr Lys Leu Tyr Ile Gln Glu Ser Gly Arg	
205 210 215	
gta aca gtc tca aca aaa aga agt caa caa aca ata atc cct aac atc	725
Val Thr Val Ser Thr Lys Arg Ser Gln Gln Thr Ile Ile Pro Asn Ile	
220 225 230	
gga tct aga ccg cgg gtc agg ggt caa tca ggc agg ata agc ata tac	773
Gly Ser Arg Pro Arg Val Arg Gly Gln Ser Gly Arg Ile Ser Ile Tyr	
235 240 245	
tgg acc att gta aaa cct gga gat atc cta atg ata aac agt aat ggc	821
Trp Thr Ile Val Lys Pro Gly Asp Ile Leu Met Ile Asn Ser Asn Gly	
250 255 260	
aac tta gtt gca ccg cgg gga tat ttt aaa ttg aaa aca ggg aaa agc	869
Asn Leu Val Ala Pro Arg Gly Tyr Phe Lys Leu Lys Thr Gly Lys Ser	
265 270 275 280	
tct gta atg aga tca gat gca ccc ata gac att tgt gtg tct gaa tgt	917
Ser Val Met Arg Ser Asp Ala Pro Ile Asp Ile Cys Val Ser Glu Cys	
285 290 295	
att aca cca aat gga agc atc ccc aac gac aaa cca ttt caa aat gtg	965
Ile Thr Pro Asn Gly Ser Ile Pro Asn Asp Lys Pro Phe Gln Asn Val	
300 305 310	
aac aaa gtt aca tat gga aaa tgc ccc aag tat atc agg caa aac act	1013
Asn Lys Val Thr Tyr Gly Lys Cys Pro Lys Tyr Ile Arg Gln Asn Thr	
315 320 325	
tta aag ctg gcc act ggg atg agg aat gta cca gaa aag caa atc aga	1061
Leu Lys Leu Ala Thr Gly Met Arg Asn Val Pro Glu Lys Gln Ile Arg	
330 335 340	
gga atc ttt gga gca ata gcg gga ttc ata gaa aac ggc tgg gaa gga	1109
Gly Ile Phe Gly Ala Ile Ala Gly Phe Ile Glu Asn Gly Trp Glu Gly	
345 350 355 360	
atg gtt gat ggg tgg tat gga ttc cga tat caa aac tcg gaa gga aca	1157
Met Val Asp Gly Trp Tyr Gly Phe Arg Tyr Gln Asn Ser Glu Gly Thr	
365 370 375	
gga caa gct gca gat cta aag agc act caa gca gcc atc gac cag atc	1205
Gly Gln Ala Ala Asp Leu Lys Ser Thr Gln Ala Ala Ile Asp Gln Ile	
380 385 390	

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aat gga aaa tta aac aga gtg att gaa agg acc aat gag aaa ttc cat 1253
 Asn Gly Lys Leu Asn Arg Val Ile Glu Arg Thr Asn Glu Lys Phe His
 395 400 405

caa ata gag aag gaa ttc tca gaa gta gaa ggg agg atc cag gac ttg 1301
 Gln Ile Glu Lys Glu Phe Ser Glu Val Glu Gly Arg Ile Gln Asp Leu
 410 415 420

gag aag tat gta gaa gac acc aaa ata gac cta tgg tcc tac aat gca 1349
 Glu Lys Tyr Val Glu Asp Thr Lys Ile Asp Leu Trp Ser Tyr Asn Ala
 425 430 435 440

gaa ttg ctg gtg gct cta aaa aat caa cat aca att gac tta aca gat 1397
 Glu Leu Leu Val Ala Leu Lys Asn Gln His Thr Ile Asp Leu Thr Asp
 445 450 455

gca gaa atg aat aaa tta ttc gag aag act aga cgc cag tta aga gaa 1445
 Ala Glu Met Asn Lys Leu Phe Glu Lys Thr Arg Arg Gln Leu Arg Glu
 460 465 470

aac gcg gaa gac atg gga ggt gga tgt ttc aag ata tac cac aaa tgt 1493
 Asn Ala Glu Asp Met Gly Gly Cys Phe Lys Ile Tyr His Lys Cys
 475 480 485

gat aat gca tgc att gga tca ata aga aat ggg aca tat gac cat tac 1541
 Asp Asn Ala Cys Ile Gly Ser Ile Arg Asn Gly Thr Tyr Asp His Tyr
 490 495 500

ata tac aga gat gaa gca tta aac aac cgg ttt caa atc aaa ggt gtt 1589
 Ile Tyr Arg Asp Glu Ala Leu Asn Asn Arg Phe Gln Ile Lys Gly Val
 505 510 515 520

gag ttg aaa tca ggc tac aaa gat tgg ata ctg tgg att tca ttc gcc 1637
 Glu Leu Lys Ser Gly Tyr Lys Asp Trp Ile Leu Trp Ile Ser Phe Ala
 525 530 535

ata tca tgc ttc tta att tgc gtt gtt cta ttg ggt ttc att atg tgg 1685
 Ile Ser Cys Phe Leu Ile Cys Val Val Leu Leu Gly Phe Ile Met Trp
 540 545 550

gct tgc caa aaa ggc aac atc aga tgc aac att tgc att tgagtaaact 1734
 Ala Cys Gln Lys Gly Asn Ile Arg Cys Asn Ile Cys Ile
 555 560 565

gatagttaaa aacacccttg tttctact 1762

<210> 8
 <211> 565
 <212> PRT
 <213> Equine influenza virus H3N8

<400> 8

Met Lys Thr Thr Ile Ile Leu Ile Pro Leu Thr His Trp Val Tyr Ser
 1 5 10 15

Gln Asn Pro Thr Ser Gly Asn Asn Thr Ala Thr Leu Cys Leu Gly His

20

25

30

His Ala Val Ala Asn Gly Thr Leu Val Lys Thr Ile Thr Asp Asp Gln
 35 40 45

Ile Glu Val Thr Asn Ala Thr Glu Leu Val Gln Ser Ile Ser Ile Gly
 50 55 60

Lys Ile Cys Asn Asn Ser Tyr Arg Val Leu Asp Gly Arg Asn Cys Thr
 65 70 75 80

Leu Ile Asp Ala Met Leu Gly Asp Pro His Cys Asp Val Phe Gln Tyr
 85 90 95

Glu Asn Trp Asp Leu Phe Ile Glu Arg Ser Ser Ala Phe Ser Ser Cys
 100 105 110

Tyr Pro Tyr Asp Ile Pro Asp Tyr Ala Ser Leu Arg Ser Ile Val Ala
 115 120 125

Ser Ser Gly Thr Leu Glu Phe Thr Ala Glu Gly Phe Thr Trp Thr Gly
 130 135 140

Val Thr Gln Asn Gly Arg Ser Gly Ser Cys Lys Arg Gly Ser Ala Asp
 145 150 155 160

Ser Phe Phe Ser Arg Leu Asn Trp Leu Thr Glu Ser Gly Asn Ser Tyr
 165 170 175

Pro Thr Leu Asn Val Thr Met Pro Asn Asn Lys Asn Phe Asp Lys Leu
 180 185 190

Tyr Ile Trp Gly Ile His His Pro Ser Ser Asn Lys Glu Gln Thr Lys
 195 200 205

Leu Tyr Ile Gln Glu Ser Gly Arg Val Thr Val Ser Thr Lys Arg Ser
 210 215 220

Gln Gln Thr Ile Ile Pro Asn Ile Gly Ser Arg Pro Arg Val Arg Gly
 225 230 235 240

Gln Ser Gly Arg Ile Ser Ile Tyr Trp Thr Ile Val Lys Pro Gly Asp
 245 250 255

Ile Leu Met Ile Asn Ser Asn Gly Asn Leu Val Ala Pro Arg Gly Tyr
 260 265 270

Phe Lys Leu Lys Thr Gly Lys Ser Ser Val Met Arg Ser Asp Ala Pro
 275 280 285

Ile Asp Ile Cys Val Ser Glu Cys Ile Thr Pro Asn Gly Ser Ile Pro
 290 295 300

Asn Asp Lys Pro Phe Gln Asn Val Asn Lys Val Thr Tyr Gly Lys Cys
 305 310 315 320

Pro Lys Tyr Ile Arg Gln Asn Thr Leu Lys Leu Ala Thr Gly Met Arg
 325 330 335

Asn Val Pro Glu Lys Gln Ile Arg Gly Ile Phe Gly Ala Ile Ala Gly
 340 345 350

Phe Ile Glu Asn Gly Trp Glu Gly Met Val Asp Gly Trp Tyr Gly Phe
 355 360 365

Arg Tyr Gln Asn Ser Glu Gly Thr Gly Gln Ala Ala Asp Leu Lys Ser
 370 375 380

Thr Gln Ala Ala Ile Asp Gln Ile Asn Gly Lys Leu Asn Arg Val Ile
 385 390 395 400

Glu Arg Thr Asn Glu Lys Phe His Gln Ile Glu Lys Glu Phe Ser Glu
 405 410 415

Val Glu Gly Arg Ile Gln Asp Leu Glu Lys Tyr Val Glu Asp Thr Lys
 420 425 430

Ile Asp Leu Trp Ser Tyr Asn Ala Glu Leu Leu Val Ala Leu Lys Asn
 435 440 445

Gln His Thr Ile Asp Leu Thr Asp Ala Glu Met Asn Lys Leu Phe Glu
 450 455 460

Lys Thr Arg Arg Gln Leu Arg Glu Asn Ala Glu Asp Met Gly Gly Gly
 465 470 475 480

Cys Phe Lys Ile Tyr His Lys Cys Asp Asn Ala Cys Ile Gly Ser Ile
 485 490 495

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Arg Asn Gly Thr Tyr Asp His Tyr Ile Tyr Arg Asp Glu Ala Leu Asn
500 505 510

Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser Gly Tyr Lys Asp
515 520 525

Trp Ile Leu Trp Ile Ser Phe Ala Ile Ser Cys Phe Leu Ile Cys Val
530 535 540

Val Leu Leu Gly Phe Ile Met Trp Ala Cys Gln Lys Gly Asn Ile Arg
545 550 555 560

Cys Asn Ile Cys Ile
565

<210> 9
<211> 1695
<212> DNA
<213> Equine influenza virus H3N8

<400> 9
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agtggcaaca acacagccac attatgtctg ggacaccatg cagtagcaaa tggaacattg 120
gtaaaaacaa taactgatga ccaaattgag gtgacaaatg ctactgaatt agttcagagc 180
atttcaatag ggaaaatatg caacaactca tatagagttc tagatggaag aaattgcaca 240
ttaatagatg caatgctagg agacccccac tgtgatgtct ttcagtatga gaattgggac 300
ctcttcatag aaagaagcag cgctttcagc agttgctacc catatgacat ccctgactat 360
gcategetcc ggtccattgt agcatcctca ggaacattgg aattcacagc agagggattc 420
acatggacag gtgtcactca aaacggaaga agtggatcct gcaaaagggg atcagccgat 480
agtttcttta gccgactgaa ttggctaaca gaatctggaa actcttacc cacttgaat 540
gtgacaatgc ctaacaataa aaatttcgac aaactataca tctgggggat tcatcaccg 600
agctcaaaca aagagcagac aaaattgtac atccaagaat cgggacgagt aacagtctca 660
acaaaaagaa gtcaacaaac aataatccct aacatcggat ctagaccgcg ggtcaggggt 720
caatcaggca ggataagcat atactggacc attgtaaaac ctggagatat cctaatagata 780
aacagtaatg gcaacttagt tgcaccgcgg ggatatttta aattgaaaac agggaaaagc 840
tctgtaatga gatcagatgc acccatagac atttgtgtgt ctgaatgtat tacaccaa 900
ggaagcatcc ccaacgacaa accatttcaa aatgtgaaca aagttacata tggaaaatgc 960

EQ-1-C2-1.ST25.txt

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cccaagtata tcaggcaaaa cactttaag ctggccactg ggatgaggaa tgtaccagaa 1020
aagcaaatca gaggaatctt tggagcaata gcgggattca tagaaaacgg ctgggaagga 1080
atggttgatg ggtggtatgg attccgatat caaaactcgg aaggaacagg acaagctgca 1140
gatctaaaga gcaactcaagc agccatcgac cagatcaatg gaaaattaaa cagagtgatt 1200
gaaaggacca atgagaaatt ccatcaaata gagaaggaat tctcagaagt agaagggagg 1260
atccaggact tggagaagta tgtagaagac accaaaatag acctatggtc ctacaatgca 1320
gaattgctgg tggctctaaa aaatcaacat acaattgact taacagatgc agaaatgaat 1380
aaattattcg agaagactag acgccagtta agagaaaacg cggaagacat gggaggtgga 1440
tgtttcaaga tataccacaa atgtgataat gcatgcattg gatcaataag aaatgggaca 1500
tatgaccatt acatatacag agatgaagca ttaaacaacc ggtttcaaata caaaggtggt 1560
gagttgaaat caggctacaa agattggata ctgtggattt cattcgccat atcatgcttc 1620
ttaatttgcg ttgttctatt gggtttcatt atgtgggctt gccaaaaagg caacatcaga 1680
tgcaacattt gcatt 1695

```

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<210> 10
<211> 1762
<212> DNA
<213> Equine influenza virus H3N8

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<220>
<221> CDS
<222> (30)..(1724)
<223>

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<400> 10
agcaaaagca ggggatatct ctgtcaatc atg aag aca acc att att ttg ata 53
                               Met Lys Thr Thr Ile Ile Leu Ile
                               1                               5

cta ctg acc cat tgg gtc tac agt caa aac cca acc agt ggc aac aac 101
Leu Leu Thr His Trp Val Tyr Ser Gln Asn Pro Thr Ser Gly Asn Asn
10                               15                               20

aca gcc aca tta tgt ctg gga cac cat gca gta gca aat gga aca ttg 149
Thr Ala Thr Leu Cys Leu Gly His His Ala Val Ala Asn Gly Thr Leu
25                               30                               35                               40

gta aaa aca ata act gat gac caa att gag gtg aca aat gct act gaa 197
Val Lys Thr Ile Thr Asp Asp Gln Ile Glu Val Thr Asn Ala Thr Glu
45                               50                               55

tta gtt cag agc att tca ata ggg aaa ata tgc aac aac tca tat aga 245
Leu Val Gln Ser Ile Ser Ile Gly Lys Ile Cys Asn Asn Ser Tyr Arg
60                               65                               70

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EQ-1-C2-1.ST25.txt

gtt cta gat gga aga aat tgc aca tta ata gat gca atg cta gga gac Val Leu Asp Gly Arg Asn Cys Thr Leu Ile Asp Ala Met Leu Gly Asp 75 80 85	293
ccc cac tgt gat gtc ttt cag tat gag aat tgg gac ctc ttc ata gaa Pro His Cys Asp Val Phe Gln Tyr Glu Asn Trp Asp Leu Phe Ile Glu 90 95 100	341
aga agc agc gct ttc agc agt tgc tac cca tat gac atc cct gac tat Arg Ser Ser Ala Phe Ser Ser Cys Tyr Pro Tyr Asp Ile Pro Asp Tyr 105 110 115 120	389
gca tcg ctc cgg tcc att gta gca tcc tca gga aca ttg gaa ttc aca Ala Ser Leu Arg Ser Ile Val Ala Ser Ser Gly Thr Leu Glu Phe Thr 125 130 135	437
gca gag gga ttc aca tgg aca ggt gtc act caa aac gga aga agt gga Ala Glu Gly Phe Thr Trp Thr Gly Val Thr Gln Asn Gly Arg Ser Gly 140 145 150	485
tcc tgc aaa agg gaa tca gcc gat agt ttc ttt agc cga ctg aat tgg Ser Cys Lys Arg Glu Ser Ala Asp Ser Phe Phe Ser Arg Leu Asn Trp 155 160 165	533
cta aca gaa tct gga aac tct tac ccc aca ttg aat gtg aca atg cct Leu Thr Glu Ser Gly Asn Ser Tyr Pro Thr Leu Asn Val Thr Met Pro 170 175 180	581
aac aat aaa aat ttc gac aaa cta tac atc tgg ggg att cat cac ccg Asn Asn Lys Asn Phe Asp Lys Leu Tyr Ile Trp Gly Ile His His Pro 185 190 195 200	629
agc tca aac aaa gag cag aca aaa ttg tac atc caa gaa tca gga cga Ser Ser Asn Lys Glu Gln Thr Lys Leu Tyr Ile Gln Glu Ser Gly Arg 205 210 215	677
gta aca gtc tca aca aaa aga agt caa caa aca ata atc cct aac atc Val Thr Val Ser Thr Lys Arg Ser Gln Gln Thr Ile Ile Pro Asn Ile 220 225 230	725
gga tct aga ccg tgg gtc agg ggt caa tca ggc agg ata agc ata tac Gly Ser Arg Pro Trp Val Arg Gly Gln Ser Gly Arg Ile Ser Ile Tyr 235 240 245	773
tgg acc att gta aaa cct gga gat atc cta acg ata aac agt aat ggc Trp Thr Ile Val Lys Pro Gly Asp Ile Leu Thr Ile Asn Ser Asn Gly 250 255 260	821
aac tta gtt gca ccg cgg gga tat ttt aaa ttg aaa aca ggg aaa agc Asn Leu Val Ala Pro Arg Gly Tyr Phe Lys Leu Lys Thr Gly Lys Ser 265 270 275 280	869
tct gta atg aga tca gat gca ccc ata gac att tgt gtg tct gaa tgt Ser Val Met Arg Ser Asp Ala Pro Ile Asp Ile Cys Val Ser Glu Cys 285 290 295	917
att aca cca aat gga agc atc ccc aac gac aaa cca ttt caa aat gtg Ile Thr Pro Asn Gly Ser Ile Pro Asn Asp Lys Pro Phe Gln Asn Val 300 305 310	965

EQ-1-C2-1.ST25.txt

aac aaa gtt aca tat gga aaa tgc ccc aag tat atc agg caa aac act Asn Lys Val Thr Tyr Gly Lys Cys Pro Lys Tyr Ile Arg Gln Asn Thr 315 320 325	1013
tta aag ctg gcc act ggg atg agg aat gta cca gaa aag caa atc aga Leu Lys Leu Ala Thr Gly Met Arg Asn Val Pro Glu Lys Gln Ile Arg 330 335 340	1061
gga atc ttt gga gca ata gcg gga ttc ata gaa aac ggc tgg gaa gga Gly Ile Phe Gly Ala Ile Ala Gly Phe Ile Glu Asn Gly Trp Glu Gly 345 350 355 360	1109
atg gtt gat ggg tgg tat gga ttc cga tat caa aac tcg gaa gga aca Met Val Asp Gly Trp Tyr Gly Phe Arg Tyr Gln Asn Ser Glu Gly Thr 365 370 375	1157
gga caa gct gca gat cta aag agc act caa gca gcc atc gac cag atc Gly Gln Ala Ala Asp Leu Lys Ser Thr Gln Ala Ala Ile Asp Gln Ile 380 385 390	1205
aat gga aaa tta aac aga gtg att gaa agg acc aat gag aaa ttc cat Asn Gly Lys Leu Asn Arg Val Ile Glu Arg Thr Asn Glu Lys Phe His 395 400 405	1253
caa ata gag aag gaa ttc tca gaa gta gaa ggg aga atc cag gac ttg Gln Ile Glu Lys Glu Phe Ser Glu Val Glu Gly Arg Ile Gln Asp Leu 410 415 420	1301
gag aag tat gta gaa gac acc aaa ata gac cta tgg tcc tac aat gca Glu Lys Tyr Val Glu Asp Thr Lys Ile Asp Leu Trp Ser Tyr Asn Ala 425 430 435 440	1349
gaa ttg ctg gtg gct cta gaa aat caa cat aca att gac tta aca gat Glu Leu Leu Val Ala Leu Glu Asn Gln His Thr Ile Asp Leu Thr Asp 445 450 455	1397
gca gaa atg aat aaa tta ttc gag aag act aga cgc cag tta aga gaa Ala Glu Met Asn Lys Leu Phe Glu Lys Thr Arg Arg Gln Leu Arg Glu 460 465 470	1445
aac gcg gaa gac atg gga ggt gga tgt ttc aag ata tac cac aaa tgt Asn Ala Glu Asp Met Gly Gly Gly Cys Phe Lys Ile Tyr His Lys Cys 475 480 485	1493
gat aat gca tgc att gga tca ata aga aat ggg aca tat gac cat tac Asp Asn Ala Cys Ile Gly Ser Ile Arg Asn Gly Thr Tyr Asp His Tyr 490 495 500	1541
ata tac aga gat gaa gca tta aac aac cgg ttt caa atc aaa ggt gtt Ile Tyr Arg Asp Glu Ala Leu Asn Asn Arg Phe Gln Ile Lys Gly Val 505 510 515 520	1589
gag ttg aaa tca ggc tac aaa gat tgg ata ctg tgg att tca ttc gcc Glu Leu Lys Ser Gly Tyr Lys Asp Trp Ile Leu Trp Ile Ser Phe Ala 525 530 535	1637
ata tca tgc ttc tta att tgc gtt gtt cta ttg ggt ttc att atg tgg Ile Ser Cys Phe Leu Ile Cys Val Val Leu Leu Gly Phe Ile Met Trp	1685

540

545

550

gct tgc caa aaa ggc aac atc aga tgc aac att tgc att tgagtaaact 1734
 Ala Cys Gln Lys Gly Asn Ile Arg Cys Asn Ile Cys Ile
 555 560 565

gatagttaaa aacacccttg tttctact 1762

<210> 11
 <211> 565
 <212> PRT
 <213> Equine influenza virus H3N8

<400> 11

Met Lys Thr Thr Ile Ile Leu Ile Leu Leu Thr His Trp Val Tyr Ser
 1 5 10 15

Gln Asn Pro Thr Ser Gly Asn Asn Thr Ala Thr Leu Cys Leu Gly His
 20 25 30

His Ala Val Ala Asn Gly Thr Leu Val Lys Thr Ile Thr Asp Asp Gln
 35 40 45

Ile Glu Val Thr Asn Ala Thr Glu Leu Val Gln Ser Ile Ser Ile Gly
 50 55 60

Lys Ile Cys Asn Asn Ser Tyr Arg Val Leu Asp Gly Arg Asn Cys Thr
 65 70 75 80

Leu Ile Asp Ala Met Leu Gly Asp Pro His Cys Asp Val Phe Gln Tyr
 85 90 95

Glu Asn Trp Asp Leu Phe Ile Glu Arg Ser Ser Ala Phe Ser Ser Cys
 100 105 110

Tyr Pro Tyr Asp Ile Pro Asp Tyr Ala Ser Leu Arg Ser Ile Val Ala
 115 120 125

Ser Ser Gly Thr Leu Glu Phe Thr Ala Glu Gly Phe Thr Trp Thr Gly
 130 135 140

Val Thr Gln Asn Gly Arg Ser Gly Ser Cys Lys Arg Glu Ser Ala Asp
 145 150 155 160

Ser Phe Phe Ser Arg Leu Asn Trp Leu Thr Glu Ser Gly Asn Ser Tyr
 165 170 175

EQ-1-C2-1.ST25.txt

Pro Thr Leu Asn Val Thr Met Pro Asn Asn Lys Asn Phe Asp Lys Leu
180 185 190

Tyr Ile Trp Gly Ile His His Pro Ser Ser Asn Lys Glu Gln Thr Lys
195 200 205

Leu Tyr Ile Gln Glu Ser Gly Arg Val Thr Val Ser Thr Lys Arg Ser
210 215 220

Gln Gln Thr Ile Ile Pro Asn Ile Gly Ser Arg Pro Trp Val Arg Gly
225 230 235 240

Gln Ser Gly Arg Ile Ser Ile Tyr Trp Thr Ile Val Lys Pro Gly Asp
245 250 255

Ile Leu Thr Ile Asn Ser Asn Gly Asn Leu Val Ala Pro Arg Gly Tyr
260 265 270

Phe Lys Leu Lys Thr Gly Lys Ser Ser Val Met Arg Ser Asp Ala Pro
275 280 285

Ile Asp Ile Cys Val Ser Glu Cys Ile Thr Pro Asn Gly Ser Ile Pro
290 295 300

Asn Asp Lys Pro Phe Gln Asn Val Asn Lys Val Thr Tyr Gly Lys Cys
305 310 315 320

Pro Lys Tyr Ile Arg Gln Asn Thr Leu Lys Leu Ala Thr Gly Met Arg
325 330 335

Asn Val Pro Glu Lys Gln Ile Arg Gly Ile Phe Gly Ala Ile Ala Gly
340 345 350

Phe Ile Glu Asn Gly Trp Glu Gly Met Val Asp Gly Trp Tyr Gly Phe
355 360 365

Arg Tyr Gln Asn Ser Glu Gly Thr Gly Gln Ala Ala Asp Leu Lys Ser
370 375 380

Thr Gln Ala Ala Ile Asp Gln Ile Asn Gly Lys Leu Asn Arg Val Ile
385 390 395 400

Glu Arg Thr Asn Glu Lys Phe His Gln Ile Glu Lys Glu Phe Ser Glu
405 410 415

Val Glu Gly Arg Ile Gln Asp Leu Glu Lys Tyr Val Glu Asp Thr Lys
420 425 430

Ile Asp Leu Trp Ser Tyr Asn Ala Glu Leu Leu Val Ala Leu Glu Asn
435 440 445

Gln His Thr Ile Asp Leu Thr Asp Ala Glu Met Asn Lys Leu Phe Glu
450 455 460

Lys Thr Arg Arg Gln Leu Arg Glu Asn Ala Glu Asp Met Gly Gly Gly
465 470 475 480

Cys Phe Lys Ile Tyr His Lys Cys Asp Asn Ala Cys Ile Gly Ser Ile
485 490 495

Arg Asn Gly Thr Tyr Asp His Tyr Ile Tyr Arg Asp Glu Ala Leu Asn
500 505 510

Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser Gly Tyr Lys Asp
515 520 525

Trp Ile Leu Trp Ile Ser Phe Ala Ile Ser Cys Phe Leu Ile Cys Val
530 535 540

Val Leu Leu Gly Phe Ile Met Trp Ala Cys Gln Lys Gly Asn Ile Arg
545 550 555 560

Cys Asn Ile Cys Ile
565

<210> 12
<211> 1695
<212> DNA
<213> Equine influenza virus H3N8

<400> 12
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gtaaaaacaa taactgatga ccaaattgag gtgacaaatg ctactgaatt agttcagagc 180
atttcaatag ggaaaatatg caacaactca tatagagttc tagatggaag aaattgcaca 240
ttaatagatg caatgctagg agacccccac tgtgatgtct ttcagtatga gaattgggac 300
ctcttcatatg aaagaagcag cgcttttcagc agttgctacc catatgacat ccctgactat 360

EQ-1-C2-1.ST25.txt

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gcatcgctcc ggtccattgt agcatcctca ggaacattgg aattcacagc agaggggattc 420
acatggacag gtgtcactca aaacggaaga agtggatcct gcaaaagga atcagccgat 480
agttttcttta gccgactgaa ttggctaaca gaatctggaa actcttacct cacattgaat 540
gtgacaatgc ctaacaataa aaatttcgac aaactataca tctgggggat tcatcaccgc 600
agctcaaaca aagagcagac aaaattgtac atccaagaat caggacgagt aacagtctca 660
acaaaaagaa gtcaacaaac aataatccct aacatcggat ctagaccgtg ggtcaggggt 720
caatcaggca ggataagcat atactggacc attgtaaaac ctggagatat cctaacgata 780
aacagtaatg gcaacttagt tgcaccgagg ggatatttta aattgaaaac agggaaaagc 840
tctgtaatga gatcagatgc acccatagac atttgtgtgt ctgaatgtat tacaccaaat 900
ggaagcatcc ccaacgacaa accatttcaa aatgtgaaca aagttacata tggaaaatgc 960
cccaagtata tcaggcaaaa cacttttaaag ctggccactg ggatgaggaa tgtaccagaa 1020
aagcaaatca gaggaatctt tggagcaata gcgggattca tagaaaacgg ctgggaagga 1080
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gatctaaaga gcactcaagc agccatcgac cagatcaatg gaaaattaaa cagagtgatt 1200
gaaaggacca atgagaaatt ccatcaaata gagaaggaat tctcagaagt agaagggaga 1260
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aaattattcg agaagactag acgccagtta agagaaaacg cggaagacat gggaggtgga 1440
tgtttcaaga tataccacaa atgtgataat gcattgcatt gatcaataag aaatgggaca 1500
tatgaccatt acatatacag agatgaagca ttaaacaacc ggtttcaa at caaaggtgtt 1560
gagttgaaat caggctacaa agattggata ctgtggattt cattcgccat atcatgcttc 1620
ttaatttgcg ttgttctatt gggtttcatt atgtgggctt gccaaaaagg caacatcaga 1680
tgcaacattt gcatt 1695

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<210> 13
<211> 1241
<212> DNA
<213> Equine influenza virus H3N8

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<220>
<221> CDS
<222> (28) .. (1239)
<223>

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<400> 13

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agcaaaagca ggtcaaatat attcaat atg gag aga ata aaa gaa ctg aga gat      54
                        Met Glu Arg Ile Lys Glu Leu Arg Asp
                        1                               5

cta atg tca caa tcc cgc acc cgc gag ata cta aca aaa act act gtg      102
Leu Met Ser Gln Ser Arg Thr Arg Glu Ile Leu Thr Lys Thr Thr Val
10                               15                               20                               25

gac cac atg gcc ata atc aag aaa tac aca tca gga aga caa gag aag      150
Asp His Met Ala Ile Ile Lys Lys Tyr Thr Ser Gly Arg Gln Glu Lys
30                               35                               40

aac ccc gca ctt agg atg aag tgg atg atg gca atg aaa tac cca att      198
Asn Pro Ala Leu Arg Met Lys Trp Met Met Ala Met Lys Tyr Pro Ile
45                               50                               55

aca gca gat aag agg ata atg gaa atg att cct gag aga aat gaa cag      246
Thr Ala Asp Lys Arg Ile Met Glu Met Ile Pro Glu Arg Asn Glu Gln
60                               65                               70

ggg caa acc ctt tgg agc aaa acg aac gat gct ggc tca gac cgc gta      294
Gly Gln Thr Leu Trp Ser Lys Thr Asn Asp Ala Gly Ser Asp Arg Val
75                               80                               85

atg gta tca cct ctg gca gtg aca tgg tgg aat agg aat gga cca aca      342
Met Val Ser Pro Leu Ala Val Thr Trp Trp Asn Arg Asn Gly Pro Thr
90                               95                               100                               105

acg agc aca att cat tat cca aaa gtc tac aaa act tat ttt gaa aaa      390
Thr Ser Thr Ile His Tyr Pro Lys Val Tyr Lys Thr Tyr Phe Glu Lys
110                               115                               120

gtt gaa aga tta aaa cac gga acc ttt ggc ccc gtt cat ttt agg aat      438
Val Glu Arg Leu Lys His Gly Thr Phe Gly Pro Val His Phe Arg Asn
125                               130                               135

caa gtc aag ata aga cgg aga gtt gat gta aac cct ggt cac gcg gac      486
Gln Val Lys Ile Arg Arg Arg Val Asp Val Asn Pro Gly His Ala Asp
140                               145                               150

ctc agt gcc aaa gaa gca caa gat gtg atc atg gaa gtt gtt ttc cca      534
Leu Ser Ala Lys Glu Ala Gln Asp Val Ile Met Glu Val Val Phe Pro
155                               160                               165

aat gaa gtg gga gcc aga att cta aca tgc gaa tca caa cta aca ata      582
Asn Glu Val Gly Ala Arg Ile Leu Thr Ser Glu Ser Gln Leu Thr Ile
170                               175                               180                               185

acc aaa gag aaa aaa gaa gaa ctt cag gac tgc aaa att gcc ccc ttg      630
Thr Lys Glu Lys Lys Glu Glu Leu Gln Asp Cys Lys Ile Ala Pro Leu
190                               195                               200

atg gta gca tac atg cta gaa aga gag ttg gtc cga aaa aca aga ttc      678
Met Val Ala Tyr Met Leu Glu Arg Glu Leu Val Arg Lys Thr Arg Phe
205                               210                               215

ctc cca gtg gct ggc gga aca agc agt gta tac att gaa gtg ttg cat      726
Leu Pro Val Ala Gly Gly Thr Ser Ser Val Tyr Ile Glu Val Leu His

```


20

25

30

Lys Tyr Thr Ser Gly Arg Gln Glu Lys Asn Pro Ala Leu Arg Met Lys
 35 40 45

Trp Met Met Ala Met Lys Tyr Pro Ile Thr Ala Asp Lys Arg Ile Met
 50 55 60

Glu Met Ile Pro Glu Arg Asn Glu Gln Gly Gln Thr Leu Trp Ser Lys
 65 70 75 80

Thr Asn Asp Ala Gly Ser Asp Arg Val Met Val Ser Pro Leu Ala Val
 85 90 95

Thr Trp Trp Asn Arg Asn Gly Pro Thr Thr Ser Thr Ile His Tyr Pro
 100 105 110

Lys Val Tyr Lys Thr Tyr Phe Glu Lys Val Glu Arg Leu Lys His Gly
 115 120 125

Thr Phe Gly Pro Val His Phe Arg Asn Gln Val Lys Ile Arg Arg Arg
 130 135 140

Val Asp Val Asn Pro Gly His Ala Asp Leu Ser Ala Lys Glu Ala Gln
 145 150 155 160

Asp Val Ile Met Glu Val Val Phe Pro Asn Glu Val Gly Ala Arg Ile
 165 170 175

Leu Thr Ser Glu Ser Gln Leu Thr Ile Thr Lys Glu Lys Lys Glu Glu
 180 185 190

Leu Gln Asp Cys Lys Ile Ala Pro Leu Met Val Ala Tyr Met Leu Glu
 195 200 205

Arg Glu Leu Val Arg Lys Thr Arg Phe Leu Pro Val Ala Gly Gly Thr
 210 215 220

Ser Ser Val Tyr Ile Glu Val Leu His Leu Thr Gln Gly Thr Cys Trp
 225 230 235 240

Glu Gln Met Tyr Thr Pro Gly Gly Glu Val Arg Asn Asp Asp Ile Asp
 245 250 255

EQ-1-C2-1.ST25.txt

Gln Ser Leu Ile Ile Ala Ala Arg Asn Ile Val Arg Arg Ala Thr Val
260 265 270

Ser Ala Asp Pro Leu Ala Ser Leu Leu Glu Met Cys His Ser Thr Gln
275 280 285

Ile Gly Gly Ile Arg Met Val Asp Ile Leu Lys Gln Asn Pro Thr Glu
290 295 300

Glu Gln Ala Val Asp Ile Cys Lys Ala Ala Met Gly Leu Arg Ile Ser
305 310 315 320

Ser Ser Phe Ser Phe Gly Gly Phe Thr Phe Lys Arg Thr Ser Gly Ser
325 330 335

Ser Val Lys Arg Glu Glu Glu Met Leu Thr Gly Asn Leu Gln Thr Leu
340 345 350

Lys Ile Arg Val His Glu Gly Tyr Glu Glu Phe Thr Met Val Gly Arg
355 360 365

Arg Ala Thr Ala Ile Leu Arg Lys Ala Thr Arg Arg Leu Ile Gln Leu
370 375 380

Ile Val Ser Gly Arg Asp Glu Gln Ser Ile Ala Glu Ala Ile Ile Val
385 390 395 400

Ala Met Val Phe

<210> 15
<211> 1214
<212> DNA
<213> Equine influenza virus H3N8

<400> 15
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acaaaaacta ctgtggacca catggccata atcaagaaat acacatcagg aagacaagag 120
aagaacccccg cacttaggat gaagtggatg atggcaatga aatacccaat tacagcagat 180
aagaggataa tggaaatgat tcttgagaga aatgaacagg ggcaaaccct ttggagcaaa 240
acgaacgatg ctggctcaga ccgcgtaatg gtatcacctc tggcagtgac atggtggaat 300
aggaatggac caacaacgag cacaattcat tatccaaaag tctacaaaac ttattttgaa 360
aaagttgaaa gattaaaaca cggaaccttt ggccccgttc attttaggaa tcaagtcaag 420


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ataagacgga gagttgatgt aaaccctggt cacgcgacc tcagtgccaa agaagcacia 480
gatgtgatca tggaagttgt tttcccaa at gaagtgggag ccagaattct aacatcgga 540
tcacaactaa caataaccaa agagaaaaa gaagaacttc aggactgcaa aattgcccc 600
ttgatggtag catacatgct agaaagagag ttggtccgaa aaacaagatt cctcccagt 660
gctggcgga caagcagtgt atacattgaa gtgttgcatc tgactcaggg aacatgctgg 720
gaacaaatgt acaccccagg aggagaagtt agaaacgatg acattgatca aagtttaatt 780
attgctgccc ggaacatagt gagaagagcg acagtatcag cagatccact agcatccctg 840
ctggaaatgt gccacagtac acagattggt ggaataagga tggtagacat ccttaagcag 900
aatccaacag aggaacaagc tgtggatata tgcaaagcag caatgggggtt aagaattagc 960
tcattcattca gctttggtgg attcaccttt aagagaacaa gtggatcatc agtcaagaga 1020
gaagaagaaa tgcttacggg caaccttcaa acattgaaaa taagagtgca tgaaggctat 1080
gaagaattca caatggctcg aagaagagca acagccattc tcagaaaggc aaccagaaga 1140
ttgattcaat tgatagtaag tgggagagat gaacaatcaa ttgctgaagc aataattgta 1200
gccatggtgt tttc 1214

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<210> 16
<211> 1241
<212> DNA
<213> Equine influenza virus H3N8

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<220>
<221> CDS
<222> (28)..(1239)
<223>

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<400> 16
agcaaaagca ggtcaaatat attcaat atg gag aga ata aaa gaa ctg aga gat 54
                               Met Glu Arg Ile Lys Glu Leu Arg Asp
                               1                     5

cta atg tca caa tcc cgc acc cgc gag ata cta aca aaa act act gtg 102
Leu Met Ser Gln Ser Arg Thr Arg Glu Ile Leu Thr Lys Thr Thr Val
10                      15                      20                      25

gac cac atg gcc ata atc aag aaa tac aca tca gga aga caa gag aag 150
Asp His Met Ala Ile Ile Lys Lys Tyr Thr Ser Gly Arg Gln Glu Lys
30                      35                      40

aac ccc gca ctt agg atg aag tgg atg atg gca atg aaa tac cca att 198
Asn Pro Ala Leu Arg Met Lys Trp Met Met Ala Met Lys Tyr Pro Ile
45                      50                      55

aca gca gat aag agg ata atg gaa atg att cct gag aga aat gaa cag 246

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EQ-1-C2-1.ST25.txt

Thr Ala Asp Lys Arg Ile Met Glu Met Ile Pro Glu Arg Asn Glu Gln	
60 65 70	
ggg caa acc ctt tgg agc aaa acg aac gat gct ggc tca gac cgc gta	294
Gly Gln Thr Leu Trp Ser Lys Thr Asn Asp Ala Gly Ser Asp Arg Val	
75 80 85	
atg gta tca cct ctg gca gtg aca tgg tgg aat agg aat gga cca aca	342
Met Val Ser Pro Leu Ala Val Thr Trp Trp Asn Arg Asn Gly Pro Thr	
90 95 100 105	
acg agc aca att cat tat cca aaa gtc cac aaa act tat ttt gaa aaa	390
Thr Ser Thr Ile His Tyr Pro Lys Val His Lys Thr Tyr Phe Glu Lys	
110 115 120	
gtt gaa aga tta aaa cac gga acc ttt ggc ccc gtt cat ttt agg aat	438
Val Glu Arg Leu Lys His Gly Thr Phe Gly Pro Val His Phe Arg Asn	
125 130 135	
caa gtc aag ata aga cgg aga gtt gat gta aac cct ggt cac gcg gac	486
Gln Val Lys Ile Arg Arg Arg Val Asp Val Asn Pro Gly His Ala Asp	
140 145 150	
ctc agt gcc aaa gaa gca caa gat gtg atc atg gaa gtt gtt ttc cca	534
Leu Ser Ala Lys Glu Ala Gln Asp Val Ile Met Glu Val Val Phe Pro	
155 160 165	
aat gaa gtg gga gcc aga att cta aca tcg gaa tca caa cta aca ata	582
Asn Glu Val Gly Ala Arg Ile Leu Thr Ser Glu Ser Gln Leu Thr Ile	
170 175 180 185	
acc aaa gag aaa aaa gaa gaa ctt cag gac tgc aaa att gcc ccc ttg	630
Thr Lys Glu Lys Lys Glu Glu Leu Gln Asp Cys Lys Ile Ala Pro Leu	
190 195 200	
atg gta gca tac atg cta gaa aga gag ttg gtc cga aaa aca aga ttc	678
Met Val Ala Tyr Met Leu Glu Arg Glu Leu Val Arg Lys Thr Arg Phe	
205 210 215	
ctc cca gtg gct ggc gga aca agc agt gta tac att gaa gtg ttg cat	726
Leu Pro Val Ala Gly Gly Thr Ser Ser Val Tyr Ile Glu Val Leu His	
220 225 230	
ctg act cag gga aca tgc tgg gaa caa atg tac acc cca gga gga gaa	774
Leu Thr Gln Gly Thr Cys Trp Glu Gln Met Tyr Thr Pro Gly Gly Glu	
235 240 245	
gtt aga aac gat gac att gat caa agt tta att att gct gcc cgg aac	822
Val Arg Asn Asp Asp Ile Asp Gln Ser Leu Ile Ile Ala Ala Arg Asn	
250 255 260 265	
ata gtg aga aga gcg aca gta tca gca gat cca cta gca tcc ctg ctg	870
Ile Val Arg Arg Ala Thr Val Ser Ala Asp Pro Leu Ala Ser Leu Leu	
270 275 280	
gaa atg tgc cac agt aca cag att ggt gga ata agg atg gta gac atc	918
Glu Met Cys His Ser Thr Gln Ile Gly Gly Ile Arg Met Val Asp Ile	
285 290 295	

EQ-1-C2-1.ST25.txt

ctt aag cag aat cca aca gag gaa caa gct gtg gat ata tgc aaa gca 966
 Leu Lys Gln Asn Pro Thr Glu Glu Gln Ala Val Asp Ile Cys Lys Ala
 300 305 310

 gca atg ggg tta aga att agc tca tca ttc agc ttt ggt gga ttc acc 1014
 Ala Met Gly Leu Arg Ile Ser Ser Ser Phe Ser Phe Gly Gly Phe Thr
 315 320 325

 ttt aag aga aca agt gga tca tca gtc aag aga gaa gaa gaa atg ctt 1062
 Phe Lys Arg Thr Ser Gly Ser Ser Val Lys Arg Glu Glu Glu Met Leu
 330 335 340 345

 acg ggc aac ctt caa aca ttg aaa ata aga gtg cat gaa ggc tat gaa 1110
 Thr Gly Asn Leu Gln Thr Leu Lys Ile Arg Val His Glu Gly Tyr Glu
 350 355 360

 gaa ttc aca atg gtc gga aga aga gca aca gcc att ctc aga aag gca 1158
 Glu Phe Thr Met Val Gly Arg Arg Ala Thr Ala Ile Leu Arg Lys Ala
 365 370 375

 acc aga aga ttg att caa ttg ata gta agt ggg aga gat gaa caa tca 1206
 Thr Arg Arg Leu Ile Gln Leu Ile Val Ser Gly Arg Asp Glu Gln Ser
 380 385 390

 att gct gaa gca ata att gta gcc atg gtg ttt tc 1241
 Ile Ala Glu Ala Ile Ile Val Ala Met Val Phe
 395 400

<210> 17
 <211> 404
 <212> PRT
 <213> Equine influenza virus H3N8

<400> 17

Met Glu Arg Ile Lys Glu Leu Arg Asp Leu Met Ser Gln Ser Arg Thr
 1 5 10 15

 Arg Glu Ile Leu Thr Lys Thr Thr Val Asp His Met Ala Ile Ile Lys
 20 25 30

 Lys Tyr Thr Ser Gly Arg Gln Glu Lys Asn Pro Ala Leu Arg Met Lys
 35 40 45

 Trp Met Met Ala Met Lys Tyr Pro Ile Thr Ala Asp Lys Arg Ile Met
 50 55 60

 Glu Met Ile Pro Glu Arg Asn Glu Gln Gly Gln Thr Leu Trp Ser Lys
 65 70 75 80

 Thr Asn Asp Ala Gly Ser Asp Arg Val Met Val Ser Pro Leu Ala Val
 85 90 95

Thr Trp Trp Asn Arg Asn Gly Pro Thr Thr Ser Thr Ile His Tyr Pro
 100 105 110

Lys Val His Lys Thr Tyr Phe Glu Lys Val Glu Arg Leu Lys His Gly
 115 120 125

Thr Phe Gly Pro Val His Phe Arg Asn Gln Val Lys Ile Arg Arg Arg
 130 135 140

Val Asp Val Asn Pro Gly His Ala Asp Leu Ser Ala Lys Glu Ala Gln
 145 150 155 160

Asp Val Ile Met Glu Val Val Phe Pro Asn Glu Val Gly Ala Arg Ile
 165 170 175

Leu Thr Ser Glu Ser Gln Leu Thr Ile Thr Lys Glu Lys Lys Glu Glu
 180 185 190

Leu Gln Asp Cys Lys Ile Ala Pro Leu Met Val Ala Tyr Met Leu Glu
 195 200 205

Arg Glu Leu Val Arg Lys Thr Arg Phe Leu Pro Val Ala Gly Gly Thr
 210 215 220

Ser Ser Val Tyr Ile Glu Val Leu His Leu Thr Gln Gly Thr Cys Trp
 225 230 235 240

Glu Gln Met Tyr Thr Pro Gly Gly Glu Val Arg Asn Asp Asp Ile Asp
 245 250 255

Gln Ser Leu Ile Ile Ala Ala Arg Asn Ile Val Arg Arg Ala Thr Val
 260 265 270

Ser Ala Asp Pro Leu Ala Ser Leu Leu Glu Met Cys His Ser Thr Gln
 275 280 285

Ile Gly Gly Ile Arg Met Val Asp Ile Leu Lys Gln Asn Pro Thr Glu
 290 295 300

Glu Gln Ala Val Asp Ile Cys Lys Ala Ala Met Gly Leu Arg Ile Ser
 305 310 315 320

Ser Ser Phe Ser Phe Gly Gly Phe Thr Phe Lys Arg Thr Ser Gly Ser
 325 330 335

Ser Val Lys Arg Glu Glu Glu Met Leu Thr Gly Asn Leu Gln Thr Leu
 340 345 350

Lys Ile Arg Val His Glu Gly Tyr Glu Glu Phe Thr Met Val Gly Arg
 355 360 365

Arg Ala Thr Ala Ile Leu Arg Lys Ala Thr Arg Arg Leu Ile Gln Leu
 370 375 380

Ile Val Ser Gly Arg Asp Glu Gln Ser Ile Ala Glu Ala Ile Ile Val
 385 390 395 400

Ala Met Val Phe

<210> 18
 <211> 1214
 <212> DNA
 <213> Equine influenza virus H3N8

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 acaaaaaacta ctgtggacca catggccata atcaagaaat acacatcagg aagacaagag 120
 aagaaccccc cacttaggat gaagtggatg atggcaatga aatacccaat tacagcagat 180
 aagaggataa tggaaatgat tcctgagaga aatgaacagg ggcaaaccct ttggagcaaa 240
 acgaacgatg ctggctcaga ccgcgtaatg gtatcacctc tggcagtgac atggtggaat 300
 aggaatggac caacaacgag cacaattcat tatccaaaag tccacaaaac ttattttgaa 360
 aaagttgaaa gattaaaaca cggaaccttt ggccccgttc attttaggaa tcaagtcaag 420
 ataagacgga gagttgatgt aaacctgtgt cacgcggacc tcagtgccaa agaagcacia 480
 gatgtgatca tggaagttgt tttcccaa atgaagtgggag ccagaattct aacatcggaa 540
 tcacaactaa caataaccaa agagaaaaaa gaagaacttc aggactgcaa aattgcccc 600
 ttgatggtag catacatgct agaaagagag ttggtccgaa aaacaagatt cctcccagtg 660
 gctggcgga caagcagtg atacattgaa gtgttgcatc tgactcaggg aacatgctgg 720
 gaacaaatgt acaccccagg aggagaagtt agaaacgatg acattgatca aagtttaatt 780
 attgctgccc ggaacatagt gagaagagcg acagtatcag cagatccact agcatccctg 840
 ctggaaatgt gccacagtac acagattggt ggaataagga tggtagacat ccttaagcag 900
 aatccaacag aggaacaagc tgtggatata tgcaaagcag caatgggggtt aagaattagc 960

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tcatcattca gctttggtgg attcaccttt aagagaacaa gtggatcatc agtcaagaga 1020
gaagaagaaa tgcttacggg caaccttcaa acattgaaaa taagagtgc tgaaggctat 1080
gaagaattca caatgggtcgg aagaagagca acagccattc tcagaaaggc aaccagaaga 1140
ttgattcaat tgatagtaag tgggagagat gaacaatcaa ttgctgaagc aataattgta 1200
gccatggtgt tttc 1214

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<210> 19
<211> 1233
<212> DNA
<213> Equine influenza virus H3N8

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<220>
<221> CDS
<222> (3)..(1196)
<223>

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<400> 19
ta gaa ttc aca atg gtc gga aga aga gca aca gcc att ctc aga aag 47
  Glu Phe Thr Met Val Gly Arg Arg Ala Thr Ala Ile Leu Arg Lys
    1             5             10             15

gca acc aga aga ttg att caa ttg ata gta agt ggg aga gat gaa caa 95
Ala Thr Arg Arg Leu Ile Gln Leu Ile Val Ser Gly Arg Asp Glu Gln
    20             25             30

tca att gct gaa gca ata att gta gcc atg gtg ttt tcg caa gaa gat 143
Ser Ile Ala Glu Ala Ile Ile Val Ala Met Val Phe Ser Gln Glu Asp
    35             40             45

tgc atg ata aaa gca gtt cga ggc gat ttg aac ttc gtt aat aga gca 191
Cys Met Ile Lys Ala Val Arg Gly Asp Leu Asn Phe Val Asn Arg Ala
    50             55             60

aat cag cgc ttg aac ccc atg cat caa ctc ttg agg cat ttc caa aaa 239
Asn Gln Arg Leu Asn Pro Met His Gln Leu Leu Arg His Phe Gln Lys
    65             70             75

gat gca aaa gtg ctt ttc cag aat tgg ggg att gaa ccc atc gac aat 287
Asp Ala Lys Val Leu Phe Gln Asn Trp Gly Ile Glu Pro Ile Asp Asn
    80             85             90             95

gtg atg gga atg att gga ata ttg cct gac atg acc cca agc acc gag 335
Val Met Gly Met Ile Gly Ile Leu Pro Asp Met Thr Pro Ser Thr Glu
    100            105            110

atg tca ttg aga gga gtg aga gtc agc aaa atg gga gtg gat gag tac 383
Met Ser Leu Arg Gly Val Arg Val Ser Lys Met Gly Val Asp Glu Tyr
    115            120            125

tcc agc act gag aga gtg gtg gtg agc att gac cgt ttt tta aga gtt 431
Ser Ser Thr Glu Arg Val Val Val Ser Ile Asp Arg Phe Leu Arg Val
    130            135            140

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EQ-1-C2-1.ST25.txt

cgg gat caa agg gga aac ata cta ctg tcc cct gaa gag gtc agt gaa Arg Asp Gln Arg Gly Asn Ile Leu Leu Ser Pro Glu Glu Val Ser Glu 145 150 155	479
aca caa gga acg gaa aag ctg aca ata att tat tca tca tca atg atg Thr Gln Gly Thr Glu Lys Leu Thr Ile Ile Tyr Ser Ser Ser Met Met 160 165 170 175	527
tgg gag att aat ggt ccc gaa tca gtg ttg gtc aat act tat caa tgg Trp Glu Ile Asn Gly Pro Glu Ser Val Leu Val Asn Thr Tyr Gln Trp 180 185 190	575
atc atc agg aac tgg gaa att gtg aaa att caa tgg tca cag gat ccc Ile Ile Arg Asn Trp Glu Ile Val Lys Ile Gln Trp Ser Gln Asp Pro 195 200 205	623
aca atg tta tac aat aag ata gaa ttt gag cca ttc cag tcc ctg gtc Thr Met Leu Tyr Asn Lys Ile Glu Phe Glu Pro Phe Gln Ser Leu Val 210 215 220	671
cct agg gcc acc aga agc caa tac agc ggt ttc gta aga acc ctg ttt Pro Arg Ala Thr Arg Ser Gln Tyr Ser Gly Phe Val Arg Thr Leu Phe 225 230 235	719
cag caa atg cga gat gta ctt gga aca ttt gat act gct caa ata ata Gln Gln Met Arg Asp Val Leu Gly Thr Phe Asp Thr Ala Gln Ile Ile 240 245 250 255	767
aaa ctc ctc cct ttt gcc gct gct cct ccg gaa cag agt agg atg cag Lys Leu Leu Pro Phe Ala Ala Ala Pro Pro Glu Gln Ser Arg Met Gln 260 265 270	815
ttc tct tct ttg act gtt aat gta aga gga tcg gga atg agg ata ctt Phe Ser Ser Leu Thr Val Asn Val Arg Gly Ser Gly Met Arg Ile Leu 275 280 285	863
gta aga ggc aat tcc cca gtg ttc aac tac aat aaa gcc act aag agg Val Arg Gly Asn Ser Pro Val Phe Asn Tyr Asn Lys Ala Thr Lys Arg 290 295 300	911
ctc aca gtc ctc gga aag gat gca ggt gcg ctt act gaa gac cca gat Leu Thr Val Leu Gly Lys Asp Ala Gly Ala Leu Thr Glu Asp Pro Asp 305 310 315	959
gaa ggt acg gct gga gta gaa tct gct gtt cta aga ggg ttt ctc att Glu Gly Thr Ala Gly Val Glu Ser Ala Val Leu Arg Gly Phe Leu Ile 320 325 330 335	1007
tta ggt aaa gaa aac aag aga tat ggc cca gca cta agc atc aat gaa Leu Gly Lys Glu Asn Lys Arg Tyr Gly Pro Ala Leu Ser Ile Asn Glu 340 345 350	1055
ctg agc aaa ctt gca aaa ggg gag aaa gct aat gtg cta att ggg caa Leu Ser Lys Leu Ala Lys Gly Glu Lys Ala Asn Val Leu Ile Gly Gln 355 360 365	1103
ggg gac gtg gtg ttg gta atg aaa cgg aaa cgt gac tct agc ata ctt Gly Asp Val Val Leu Val Met Lys Arg Lys Arg Asp Ser Ser Ile Leu 1151	

370

375

380

act gac agc cag aca gcg acc aaa agg att cgg atg gcc atc aat 1196
 Thr Asp Ser Gln Thr Ala Thr Lys Arg Ile Arg Met Ala Ile Asn
 385 390 395

tagtgttgaa ttgttttaaaa acgaccttgt ttctact 1233

<210> 20

<211> 398

<212> PRT

<213> Equine influenza virus H3N8

<400> 20

Glu Phe Thr Met Val Gly Arg Arg Ala Thr Ala Ile Leu Arg Lys Ala
 1 5 10 15

Thr Arg Arg Leu Ile Gln Leu Ile Val Ser Gly Arg Asp Glu Gln Ser
 20 25 30

Ile Ala Glu Ala Ile Ile Val Ala Met Val Phe Ser Gln Glu Asp Cys
 35 40 45

Met Ile Lys Ala Val Arg Gly Asp Leu Asn Phe Val Asn Arg Ala Asn
 50 55 60

Gln Arg Leu Asn Pro Met His Gln Leu Leu Arg His Phe Gln Lys Asp
 65 70 75 80

Ala Lys Val Leu Phe Gln Asn Trp Gly Ile Glu Pro Ile Asp Asn Val
 85 90 95

Met Gly Met Ile Gly Ile Leu Pro Asp Met Thr Pro Ser Thr Glu Met
 100 105 110

Ser Leu Arg Gly Val Arg Val Ser Lys Met Gly Val Asp Glu Tyr Ser
 115 120 125

Ser Thr Glu Arg Val Val Val Ser Ile Asp Arg Phe Leu Arg Val Arg
 130 135 140

Asp Gln Arg Gly Asn Ile Leu Leu Ser Pro Glu Glu Val Ser Glu Thr
 145 150 155 160

Gln Gly Thr Glu Lys Leu Thr Ile Ile Tyr Ser Ser Ser Met Met Trp
 165 170 175

EQ-1-C2-1.ST25.txt

Glu Ile Asn Gly Pro Glu Ser Val Leu Val Asn Thr Tyr Gln Trp Ile
 180 185 190

Ile Arg Asn Trp Glu Ile Val Lys Ile Gln Trp Ser Gln Asp Pro Thr
 195 200 205

Met Leu Tyr Asn Lys Ile Glu Phe Glu Pro Phe Gln Ser Leu Val Pro
 210 215 220

Arg Ala Thr Arg Ser Gln Tyr Ser Gly Phe Val Arg Thr Leu Phe Gln
 225 230 235 240

Gln Met Arg Asp Val Leu Gly Thr Phe Asp Thr Ala Gln Ile Ile Lys
 245 250 255

Leu Leu Pro Phe Ala Ala Ala Pro Pro Glu Gln Ser Arg Met Gln Phe
 260 265 270

Ser Ser Leu Thr Val Asn Val Arg Gly Ser Gly Met Arg Ile Leu Val
 275 280 285

Arg Gly Asn Ser Pro Val Phe Asn Tyr Asn Lys Ala Thr Lys Arg Leu
 290 295 300

Thr Val Leu Gly Lys Asp Ala Gly Ala Leu Thr Glu Asp Pro Asp Glu
 305 310 315 320

Gly Thr Ala Gly Val Glu Ser Ala Val Leu Arg Gly Phe Leu Ile Leu
 325 330 335

Gly Lys Glu Asn Lys Arg Tyr Gly Pro Ala Leu Ser Ile Asn Glu Leu
 340 345 350

Ser Lys Leu Ala Lys Gly Glu Lys Ala Asn Val Leu Ile Gly Gln Gly
 355 360 365

Asp Val Val Leu Val Met Lys Arg Lys Arg Asp Ser Ser Ile Leu Thr
 370 375 380

Asp Ser Gln Thr Ala Thr Lys Arg Ile Arg Met Ala Ile Asn
 385 390 395

<210> 21
 <211> 1194

<212> DNA

<213> Equine influenza virus H3N8

<400> 21

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atgggtgtttt cgcaagaaga ttgcatgata aaagcagttc gaggcgattt gaacttcggt      180
aatagagcaa atcagcgctt gaaccccatg catcaactct tgaggcattt ccaaaaagat      240
gcaaaagtgc ttttccagaa ttgggggatt gaacccatcg acaatgtgat gggaatgatt      300
ggaatattgc ctgacatgac cccaagcacc gagatgtcat tgagaggagt gagagtcagc      360
aaaatgggag tggatgagta ctccagcact gagagagtgg tggtagcat tgaccgtttt      420
ttaagagttc gggatcaaag gggaaacata ctactgtccc ctgaagaggt cagtgaaca      480
caaggaacgg aaaagctgac aataatttat tcatcatcaa tgatgtggga gattaatggg      540
ccogaatcag tgttgggtcaa tacttatcaa tggatcatca ggaactggga aattgtgaaa      600
attcaatggg cacaggatcc cacaatgtta tacaataaga tagaatttga gccattccag      660
tccttggtcc ctagggccac cagaagccaa tacagcggtt tcgtaagaac cctgtttcag      720
caaatgcgag atgtacttgg aacatttgat actgctcaaa taataaaact cctccctttt      780
gccgtgctc ctccggaaca gagtaggatg cagttctctt ctttgactgt taatgtaaga      840
ggatcgggaa tgaggatact tgtaagaggc aattccccag tgttcaacta caataaagcc      900
actaagaggc tcacagtcct cggaaaggat gcagggtgcg ttactgaaga cccagatgaa      960
ggtacggctg gagtagaatc tgctgttcta agagggtttc tcattttagg taaagaaaac     1020
aagagatatg gccagcact aagcatcaat gaactgagca aacttgcaaa aggggagaaa     1080
gctaattgtc taattgggca aggggacgtg gtgttggtaa tgaaacggaa acgtgactct     1140
agcatactta ctgacagcca gacagcgacc aaaaggattc ggatggccat caat           1194

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<210> 22

<211> 1232

<212> DNA

<213> Equine influenza virus H3N8

<400> 22

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agaattcaca atggtcggaa gaagagcaac agccattctc agaaaggcaa ccagaagatt      60
gattcaattg atagtaagtg ggagagatga acaatcaatt gctgaagcaa taattgtagc     120
catgggtgtt tcgcaagaag attgcatgat aaaagcagtt cgaggcgatt tgaacttcgt     180
taatagagca aatcagcgct tgaaccccat gcatcaactc ttgaggcatt tccaaaaaga     240

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EQ-1-C2-1.ST25.txt

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tgcaaaagtg cttttccaga attgggggat tgaacccatc gacaatgtga tgggaatgat      300
tggaatattg cctgacatga cccaagcac cgagatgtca ttgagaggag tgagagtcag      360
caaaatggga gtggatgagt actccagcac tgagagagtg gtggtgagca ttgaccgttt      420
tttaagagtt cgggatcaaa ggggaaacat actactgtcc cctgaagagg tcagtgaaac      480
acaaggaacg gaaaagctga caataattta ttcacatca atgatgtggg agattaatgg      540
tcccgaatca gtgttggtca atacttatca atggatcatc aggaactggg aaattgtgaa      600
aattcaatgg tcacaggatc ccacaatgtt atacaataag atagaatttg agccattcca      660
gtccctggtc cctagggcca ccagaagcca atacagcggg ttcgtaagaa ccctgtttca      720
gcaaatgcga gatgtacttg gaacatttga tactgctcaa ataataaaac tcctcccttt      780
tgccgctgct cctccggaac agagtaggat gcagttctct tctttgactg ttaatgtaag      840
aggatcggga atgaggatac ttgtaagagg caattcccca gtgttcaact acaataaagc      900
cactaagagg ctcacagtcc tcggaagga tgcaggtgcg cttactgaag acccagatga      960
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caagagatat ggcccagcac taagcatcaa tgaactgagc aaacttgcaa aaggggagaa    1080
agctaattgtg ctaattgggc aaggggacgt ggtgttggtg atgaaacgga aacgtgactc    1140
tagcatactt actgacagcc agacagcgac caaaaggatt cggatggcca tcaattagtg    1200
ttgaattgtt taaaaacgac cttgtttcta ct                                     1232

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<210> 23
 <211> 1232
 <212> DNA
 <213> Equine influenza virus H3N8

<220>
 <221> CDS
 <222> (2)..(1195)
 <223>

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<400> 23
a gaa ttc aca atg gtc gga aga aga gca aca gcc att ctc aga aag gca      49
  Glu Phe Thr Met Val Gly Arg Arg Ala Thr Ala Ile Leu Arg Lys Ala
   1               5               10               15

acc aga aga ttg att caa ttg ata gta agt ggg aga gat gaa caa tca      97
Thr Arg Arg Leu Ile Gln Leu Ile Val Ser Gly Arg Asp Glu Gln Ser
   20               25               30

att gct gaa gca ata att gta gcc atg gtg ttt tcg caa gaa gat tgc      145
Ile Ala Glu Ala Ile Ile Val Ala Met Val Phe Ser Gln Glu Asp Cys
   35               40               45

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EQ-1-C2-1.ST25.txt

atg ata caa gca gtt cga ggc gat ttg aac ttc gtt aat aga gca aat Met Ile Gln Ala Val Arg Gly Asp Leu Asn Phe Val Asn Arg Ala Asn 50 55 60	193
cag cgc ttg aac ccc atg cat caa ctc ttg agg cat ttc caa aaa gat Gln Arg Leu Asn Pro Met His Gln Leu Leu Arg His Phe Gln Lys Asp 65 70 75 80	241
gca aaa gtg ctt ttc cag aat tgg ggg att gaa ccc atc gac aat gtg Ala Lys Val Leu Phe Gln Asn Trp Gly Ile Glu Pro Ile Asp Asn Val 85 90 95	289
atg gga atg att gga ata ttg cct gac atg acc cca agc acc gag atg Met Gly Met Ile Gly Ile Leu Pro Asp Met Thr Pro Ser Thr Glu Met 100 105 110	337
tca ttg aga gga gtg aga gtc agc aaa atg gga gtg gat gag tac tcc Ser Leu Arg Gly Val Arg Val Ser Lys Met Gly Val Asp Glu Tyr Ser 115 120 125	385
agc act gag aga gtg gtg gtg agc att gac cgt ttt tta aga gtt cgg Ser Thr Glu Arg Val Val Ser Ile Asp Arg Phe Leu Arg Val Arg 130 135 140	433
gat caa agg gga aac ata cta ctg tcc cct gaa gag gtc agt gaa aca Asp Gln Arg Gly Asn Ile Leu Leu Ser Pro Glu Glu Val Ser Glu Thr 145 150 155 160	481
caa gga acg gaa aag ctg aca ata att tat tca tca tca atg atg tgg Gln Gly Thr Glu Lys Leu Thr Ile Ile Tyr Ser Ser Ser Met Met Trp 165 170 175	529
gag att aat ggt ccc gaa tca gtg ttg gtc aat act tat caa tgg atc Glu Ile Asn Gly Pro Glu Ser Val Leu Val Asn Thr Tyr Gln Trp Ile 180 185 190	577
atc agg aac tgg gaa att gtg aaa att caa tgg tca cag gat ccc aca Ile Arg Asn Trp Glu Ile Val Lys Ile Gln Trp Ser Gln Asp Pro Thr 195 200 205	625
atg tta tac aat aag ata gaa ttt gag cca ttc cag tcc ctg gtc cct Met Leu Tyr Asn Lys Ile Glu Phe Glu Pro Phe Gln Ser Leu Val Pro 210 215 220	673
agg gcc acc aga agc caa tac agc ggt ttc gta aga acc ctg ttt cag Arg Ala Thr Arg Ser Gln Tyr Ser Gly Phe Val Arg Thr Leu Phe Gln 225 230 235 240	721
caa atg cga gat gta ctt gga aca ttt gat act gct caa ata ata aaa Gln Met Arg Asp Val Leu Gly Thr Phe Asp Thr Ala Gln Ile Ile Lys 245 250 255	769
ctc ctc cct ttt gcc gct gct cct ccg gaa cag agt agg atg cag ttc Leu Leu Pro Phe Ala Ala Ala Pro Pro Glu Gln Ser Arg Met Gln Phe 260 265 270	817
tct tct ttg act gtt aat gta aga gga tcg gga atg agg ata ctt gta Ser Ser Leu Thr Val Asn Val Arg Gly Ser Gly Met Arg Ile Leu Val 275 280 285	865

EQ-1-C2-1.ST25.txt

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aga ggc aat tcc cca gtg ttc aac tac aat aaa gcc act aag agg ctc      913
Arg Gly Asn Ser Pro Val Phe Asn Tyr Asn Lys Ala Thr Lys Arg Leu
   290                               295                               300

aca gtc ctc gga aaa gat gca ggt gcg ctt act gaa gac cca gat gaa      961
Thr Val Leu Gly Lys Asp Ala Gly Ala Leu Thr Glu Asp Pro Asp Glu
   305                               310                               315                               320

ggt. acg gct gga gta gaa tct gct gtt cta aga ggg ttt ctc att tta      1009
Gly Thr Ala Gly Val Glu Ser Ala Val Leu Arg Gly Phe Leu Ile Leu
                               325                               330                               335

ggt. aaa gaa aac aag aga tat ggc cca gca cta agc atc aat gaa ctg      1057
Gly Lys Glu Asn Lys Arg Tyr Gly Pro Ala Leu Ser Ile Asn Glu Leu
                               340                               345                               350

agc aaa ctt gca aaa ggg gag aaa gct aat gtg cta att ggg caa ggg      1105
Ser Lys Leu Ala Lys Gly Glu Lys Ala Asn Val Leu Ile Gly Gln Gly
                               355                               360                               365

gac gtg gtg ttg gta atg aaa cgg aaa cgt gac tct agc ata ctt act      1153
Asp Val Val Leu Val Met Lys Arg Lys Arg Asp Ser Ser Ile Leu Thr
   370                               375                               380

gac agc cag aca gcg acc aaa agg att cgg atg gcc atc aat      1195
Asp Ser Gln Thr Ala Thr Lys Arg Ile Arg Met Ala Ile Asn
   385                               390                               395

tagtgttgaa ttgtttaaaa acgaccttgt ttctact      1232

```

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<210> 24
<211> 398
<212> PRT
<213> Equine influenza virus H3N8

```

```

<400> 24

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Glu Phe Thr Met Val Gly Arg Arg Ala Thr Ala Ile Leu Arg Lys Ala
1                               5                               10                               15

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```

Thr Arg Arg Leu Ile Gln Leu Ile Val Ser Gly Arg Asp Glu Gln Ser
                20                               25                               30

```

```

Ile Ala Glu Ala Ile Ile Val Ala Met Val Phe Ser Gln Glu Asp Cys
35                               40                               45

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```

Met Ile Gln Ala Val Arg Gly Asp Leu Asn Phe Val Asn Arg Ala Asn
50                               55                               60

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Gln Arg Leu Asn Pro Met His Gln Leu Leu Arg His Phe Gln Lys Asp
65                               70                               75                               80

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EQ-1-C2-1.ST25.txt

Ala Lys Val Leu Phe Gln Asn Trp Gly Ile Glu Pro Ile Asp Asn Val
85 90 95

Met Gly Met Ile Gly Ile Leu Pro Asp Met Thr Pro Ser Thr Glu Met
100 105 110

Ser Leu Arg Gly Val Arg Val Ser Lys Met Gly Val Asp Glu Tyr Ser
115 120 125

Ser Thr Glu Arg Val Val Val Ser Ile Asp Arg Phe Leu Arg Val Arg
130 135 140

Asp Gln Arg Gly Asn Ile Leu Leu Ser Pro Glu Glu Val Ser Glu Thr
145 150 155 160

Gln Gly Thr Glu Lys Leu Thr Ile Ile Tyr Ser Ser Ser Met Met Trp
165 170 175

Glu Ile Asn Gly Pro Glu Ser Val Leu Val Asn Thr Tyr Gln Trp Ile
180 185 190

Ile Arg Asn Trp Glu Ile Val Lys Ile Gln Trp Ser Gln Asp Pro Thr
195 200 205

Met Leu Tyr Asn Lys Ile Glu Phe Glu Pro Phe Gln Ser Leu Val Pro
210 215 220

Arg Ala Thr Arg Ser Gln Tyr Ser Gly Phe Val Arg Thr Leu Phe Gln
225 230 235 240

Gln Met Arg Asp Val Leu Gly Thr Phe Asp Thr Ala Gln Ile Ile Lys
245 250 255

Leu Leu Pro Phe Ala Ala Ala Pro Pro Glu Gln Ser Arg Met Gln Phe
260 265 270

Ser Ser Leu Thr Val Asn Val Arg Gly Ser Gly Met Arg Ile Leu Val
275 280 285

Arg Gly Asn Ser Pro Val Phe Asn Tyr Asn Lys Ala Thr Lys Arg Leu
290 295 300

Thr Val Leu Gly Lys Asp Ala Gly Ala Leu Thr Glu Asp Pro Asp Glu
305 310 315 320

EQ-1-C2-1.ST25.txt

Gly Thr Ala Gly Val Glu Ser Ala Val Leu Arg Gly Phe Leu Ile Leu
325 330 335

Gly Lys Glu Asn Lys Arg Tyr Gly Pro Ala Leu Ser Ile Asn Glu Leu
340 345 350

Ser Lys Leu Ala Lys Gly Glu Lys Ala Asn Val Leu Ile Gly Gln Gly
355 360 365

Asp Val Val Leu Val Met Lys Arg Lys Arg Asp Ser Ser Ile Leu Thr
370 375 380

Asp Ser Gln Thr Ala Thr Lys Arg Ile Arg Met Ala Ile Asn
385 390 395

<210> 25
<211> 1194
<212> DNA
<213> Equine influenza virus H3N8

<400> 25
gaattcacaa tggtcggaag aagagcaaca gccattctca gaaaggcaac cagaagattg 60
attcaattga tagtaagtgg gagagatgaa caatcaattg ctgaagcaat aattgtagcc 120
atggtgtttt cgcaagaaga ttgcatgata caagcagttc gaggcgattt gaacttcggt 180
aatagagcaa atcagcgctt gaaccccatg catcaactct tgaggcattt ccaaaaagat 240
gcaaaagtgc ttttccagaa ttgggggatt gaacccatcg acaatgtgat gggaatgatt 300
ggaatattgc ctgacatgac cccaagcacc gagatgtcat tgagaggagt gagagtcagc 360
aaaatgggag tggatgagta ctccagcact gagagagtgg tggatgagcat tgaccgtttt 420
ttaagagttc gggatcaaag gggaaacata ctactgtccc ctgaagaggt cagtgaacaa 480
caaggaacgg aaaagctgac aataatttat tcatcatcaa tgatgtggga gattaatggt 540
cccgaatcag tgttggtcaa tacttatcaa tggatcatca ggaactggga aattgtgaaa 600
attcaatggt cacaggatcc cacaatgtta tacaataaga tagaatttga gccattccag 660
tccttggtcc ctagggccac cagaagccaa tacagcgggt tcgtaagaac cctgtttcag 720
caaatgcgag atgtacttgg aacatttgat actgctcaaa taataaaact cctccctttt 780
gccgtgctc ctccggaaca gagtaggatg cagttctctt ctttgactgt taatgtaaga 840
ggatcgggaa tgaggatact tgtaagaggc aattccccag tgttcaacta caataaagcc 900
actaagaggc tcacagtcct cggaaaagat gcagggtgcgc ttactgaaga cccagatgaa 960

ggtacggctg gagtagaatc tgctgttcta agagggtttc tcatttttagg taaagaaaac 1020
aagagatatg gcccagcact aagcatcaat gaactgagca aacttgcaaa aggggagaaa 1080
gctaattgtgc taattgggca aggggacgtg gtgttggtaa tgaaacggaa acgtgactct 1140
agcatactta ctgacagcca gacagcgacc aaaaggattc ggatggccat caat 1194

<210> 26
<211> 23
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 26
agcaaaagca ggtagatatt gaa 23

<210> 27
<211> 24
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 27
agtagaaaca aggtagtttt ttac 24

<210> 28
<211> 18
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 28
caggaaacag ctatgacc 18

<210> 29
<211> 20
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 29
taatacgact cactataggg 20

<210> 30
<211> 18

<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 30
tggtgcacta gccagctg

18

<210> 31
<211> 18
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 31
ttgcctgtac catctgcc

18

<210> 32
<211> 23
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 32
agcaaaagca ggggatattt ctg

23

<210> 33
<211> 23
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 33
agtagaaaca aggggtgtttt taa

23

<210> 34
<211> 16
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 34
gacatccctg actatg

16

<210> 35

<211> 16
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 35
gcacatctgtta agtcaa

16

<210> 36
<211> 25
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 36
agcaaaagca ggtcaaatat attca

25

<210> 37
<211> 26
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 37
gaaaacacca tggctacaat tattgc

26

<210> 38
<211> 27
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 38
agaattcaca atggctcggaa gaagagc

27

<210> 39
<211> 27
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 39
agtagaaaca aggtcgtttt taaacaa

27

<210> 40
<211> 19
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 40
agccgtacct tcactctggg

19

<210> 41
<211> 19
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 41
agcactgaga gagtgggtgg

19

<210> 42
<211> 19
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 42
gtaagaggca attccccag

19

<210> 43
<211> 18
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 43
cagcttttcc gttccttg

18

<210> 44
<211> 2341
<212> DNA
<213> Equine influenza virus H3N8

<220>
<221> CDS
<222> (28)..(2304)
<223>

EQ-1-C2-1.ST25.txt

<400> 44

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agcaaaagca ggtcaaatat attcaat atg gag aga ata aaa gaa ctg aga gat      54
Met Glu Arg Ile Lys Glu Leu Arg Asp
1                               5

cta atg tca caa tcc cgc acc cgc gag ata cta aca aaa act act gtg      102
Leu Met Ser Gln Ser Arg Thr Arg Glu Ile Leu Thr Lys Thr Thr Val
10                             15                             20                             25

gac cac atg gcc ata atc aag aaa tac aca tca gga aga caa gag aag      150
Asp His Met Ala Ile Ile Lys Lys Tyr Thr Ser Gly Arg Gln Glu Lys
30                             35                             40

aac ccc gca ctt agg atg aag tgg atg atg gca atg aaa tac cca att      198
Asn Pro Ala Leu Arg Met Lys Trp Met Met Ala Met Lys Tyr Pro Ile
45                             50                             55

aca gca gat aag agg ata atg gaa atg att cct gag aga aat gaa cag      246
Thr Ala Asp Lys Arg Ile Met Glu Met Ile Pro Glu Arg Asn Glu Gln
60                             65                             70

ggg caa acc ctt tgg agc aaa acg aac gat gct ggc tca gac cgc gta      294
Gly Gln Thr Leu Trp Ser Lys Thr Asn Asp Ala Gly Ser Asp Arg Val
75                             80                             85

atg gta tca cct ctg gca gtg aca tgg tgg aat agg aat gga cca aca      342
Met Val Ser Pro Leu Ala Val Thr Trp Trp Asn Arg Asn Gly Pro Thr
90                             95                             100                             105

acg agc aca att cat tat cca aaa gtc tac aaa act tat ttt gaa aaa      390
Thr Ser Thr Ile His Tyr Pro Lys Val Tyr Lys Thr Tyr Phe Glu Lys
110                             115                             120

gtt gaa aga tta aaa cac gga acc ttt ggc ccc gtt cat ttt agg aat      438
Val Glu Arg Leu Lys His Gly Thr Phe Gly Pro Val His Phe Arg Asn
125                             130                             135

caa gtc aag ata aga cgg aga gtt gat gta aac cct ggt cac gcg gac      486
Gln Val Lys Ile Arg Arg Arg Val Asp Val Asn Pro Gly His Ala Asp
140                             145                             150

ctc agt gcc aaa gaa gca caa gat gtg atc atg gaa gtt gtt ttc cca      534
Leu Ser Ala Lys Glu Ala Gln Asp Val Ile Met Glu Val Val Phe Pro
155                             160                             165

aat gaa gtg gga gcc aga att cta aca tcg gaa tca caa cta aca ata      582
Asn Glu Val Gly Ala Arg Ile Leu Thr Ser Glu Ser Gln Leu Thr Ile
170                             175                             180                             185

acc aaa gag aaa aaa gaa gaa ctt cag gac tgc aaa att gcc ccc ttg      630
Thr Lys Glu Lys Lys Glu Glu Leu Gln Asp Cys Lys Ile Ala Pro Leu
190                             195                             200

atg gta gca tac atg cta gaa aga gag ttg gtc cga aaa aca aga ttc      678
Met Val Ala Tyr Met Leu Glu Arg Glu Leu Val Arg Lys Thr Arg Phe
205                             210                             215

ctc cca gtg gct ggc gga aca agc agt gta tac att gaa gtg ttg cat      726
Leu Pro Val Ala Gly Gly Thr Ser Ser Val Tyr Ile Glu Val Leu His

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220	225	230	
ctg act cag gga aca tgc tgg gaa caa atg tac acc cca gga gga gaa			774
Leu Thr Gln Gly Thr Cys Trp Glu Gln Met Tyr Thr Pro Gly Gly Glu			
235	240	245	
ggt aga aac gat gac att gat caa agt tta att att gct gcc cgg aac			822
Val Arg Asn Asp Asp Ile Asp Gln Ser Leu Ile Ile Ala Ala Arg Asn			
250	255	260	265
ata gtg aga aga gcg aca gta tca gca gat cca cta gca tcc ctg ctg			870
Ile Val Arg Arg Ala Thr Val Ser Ala Asp Pro Leu Ala Ser Leu Leu			
	270	275	280
gaa atg tgc cac agt aca cag att ggt gga ata agg atg gta gac atc			918
Glu Met Cys His Ser Thr Gln Ile Gly Gly Ile Arg Met Val Asp Ile			
	285	290	295
ctt aag cag aat cca aca gag gaa caa gct gtg gat ata tgc aaa gca			966
Leu Lys Gln Asn Pro Thr Glu Glu Gln Ala Val Asp Ile Cys Lys Ala			
	300	305	310
gca atg ggg tta aga att agc tca tca ttc agc ttt ggt gga ttc acc			1014
Ala Met Gly Leu Arg Ile Ser Ser Ser Phe Ser Phe Gly Gly Phe Thr			
	315	320	325
ttt aag aga aca agt gga tca tca gtc aag aga gaa gaa gaa atg ctt			1062
Phe Lys Arg Thr Ser Gly Ser Ser Val Lys Arg Glu Glu Glu Met Leu			
330	335	340	345
acg ggc aac ctt caa aca ttg aaa ata aga gtg cat gaa ggc tat gaa			1110
Thr Gly Asn Leu Gln Thr Leu Lys Ile Arg Val His Glu Gly Tyr Glu			
	350	355	360
gaa ttc aca atg gtc gga aga aga gca aca gcc att ctc aga aag gca			1158
Glu Phe Thr Met Val Gly Arg Arg Ala Thr Ala Ile Leu Arg Lys Ala			
	365	370	375
acc aga aga ttg att caa ttg ata gta agt ggg aga gat gaa caa tca			1206
Thr Arg Arg Leu Ile Gln Leu Ile Val Ser Gly Arg Asp Glu Gln Ser			
	380	385	390
att gct gaa gca ata att gta gcc atg gtg ttt tcg caa gaa gat tgc			1254
Ile Ala Glu Ala Ile Ile Val Ala Met Val Phe Ser Gln Glu Asp Cys			
	395	400	405
atg ata aaa gca gtt cga ggc gat ttg aac ttc gtt aat aga gca aat			1302
Met Ile Lys Ala Val Arg Gly Asp Leu Asn Phe Val Asn Arg Ala Asn			
410	415	420	425
cag cgc ttg aac ccc atg cat caa ctc ttg agg cat ttc caa aaa gat			1350
Gln Arg Leu Asn Pro Met His Gln Leu Leu Arg His Phe Gln Lys Asp			
	430	435	440
gca aaa gtg ctt ttc cag aat tgg ggg att gaa ccc atc gac aat gtg			1398
Ala Lys Val Leu Phe Gln Asn Trp Gly Ile Glu Pro Ile Asp Asn Val			
	445	450	455
atg gga atg att gga ata ttg cct gac atg acc cca agc acc gag atg			1446

EQ-1-C2-1.ST25.txt

Met Gly Met Ile Gly Ile Leu Pro Asp Met Thr Pro Ser Thr Glu Met	
460 465 470	
tca ttg aga gga gtg aga gtc agc aaa atg gga gtg gat gag tac tcc	1494
Ser Leu Arg Gly Val Arg Val Ser Lys Met Gly Val Asp Glu Tyr Ser	
475 480 485	
agc act gag aga gtg gtg gtg agc att gac cgt ttt tta aga gtt cgg	1542
Ser Thr Glu Arg Val Val Val Ser Ile Asp Arg Phe Leu Arg Val Arg	
490 495 500 505	
gat caa agg gga aac ata cta ctg tcc cct gaa gag gtc agt gaa aca	1590
Asp Gln Arg Gly Asn Ile Leu Leu Ser Pro Glu Glu Val Ser Glu Thr	
510 515 520	
caa gga acg gaa aag ctg aca ata att tat tca tca tca atg atg tgg	1638
Gln Gly Thr Glu Lys Leu Thr Ile Ile Tyr Ser Ser Ser Met Met Trp	
525 530 535	
gag att aat ggt ccc gaa tca gtg ttg gtc aat act tat caa tgg atc	1686
Glu Ile Asn Gly Pro Glu Ser Val Leu Val Asn Thr Tyr Gln Trp Ile	
540 545 550	
atc agg aac tgg gaa att gtg aaa att caa tgg tca cag gat ccc aca	1734
Ile Arg Asn Trp Glu Ile Val Lys Ile Gln Trp Ser Gln Asp Pro Thr	
555 560 565	
atg tta tac aat aag ata gaa ttt gag cca ttc cag tcc ctg gtc cct	1782
Met Leu Tyr Asn Lys Ile Glu Phe Glu Pro Phe Gln Ser Leu Val Pro	
570 575 580 585	
agg gcc acc aga agc caa tac agc ggt ttc gta aga acc ctg ttt cag	1830
Arg Ala Thr Arg Ser Gln Tyr Ser Gly Phe Val Arg Thr Leu Phe Gln	
590 595 600	
caa atg cga gat gta ctt gga aca ttt gat act gct caa ata ata aaa	1878
Gln Met Arg Asp Val Leu Gly Thr Phe Asp Thr Ala Gln Ile Ile Lys	
605 610 615	
ctc ctc cct ttt gcc gct gct cct ccg gaa cag agt agg atg cag ttc	1926
Leu Leu Pro Phe Ala Ala Ala Pro Pro Glu Gln Ser Arg Met Gln Phe	
620 625 630	
tct tct ttg act gtt aat gta aga gga tcg gga atg agg ata ctt gta	1974
Ser Ser Leu Thr Val Asn Val Arg Gly Ser Gly Met Arg Ile Leu Val	
635 640 645	
aga ggc aat tcc cca gtg ttc aac tac aat aaa gcc act aag agg ctc	2022
Arg Gly Asn Ser Pro Val Phe Asn Tyr Asn Lys Ala Thr Lys Arg Leu	
650 655 660 665	
aca gtc ctc gga aag gat gca ggt gcg ctt act gaa gac cca gat gaa	2070
Thr Val Leu Gly Lys Asp Ala Gly Ala Leu Thr Glu Asp Pro Asp Glu	
670 675 680	
ggt acg gct gga gta gaa tct gct gtt cta aga ggg ttt ctc att tta	2118
Gly Thr Ala Gly Val Glu Ser Ala Val Leu Arg Gly Phe Leu Ile Leu	
685 690 695	

EQ-1-C2-1.ST25.txt

ggt aaa gaa aac aag aga tat ggc cca gca cta agc atc aat gaa ctg 2166
Gly Lys Glu Asn Lys Arg Tyr Gly Pro Ala Leu Ser Ile Asn Glu Leu
700 705 710

agc aaa ctt gca aaa ggg gag aaa gct aat gtg cta att ggg caa ggg 2214
Ser Lys Leu Ala Lys Gly Glu Lys Ala Asn Val Leu Ile Gly Gln Gly
715 720 725

gac gtg gtg ttg gta atg aaa cgg aaa cgt gac tct agc ata ctt act 2262
Asp Val Val Leu Val Met Lys Arg Lys Arg Asp Ser Ser Ile Leu Thr
730 735 740 745

gac agc cag aca gcg acc aaa agg att cgg atg gcc atc aat 2304
Asp Ser Gln Thr Ala Thr Lys Arg Ile Arg Met Ala Ile Asn
750 755

tagtggtgaa ttgttttaaaa acgaccttgt ttctact 2341

<210> 45
<211> 759
<212> PRT
<213> Equine influenza virus H3N8

<400> 45

Met Glu Arg Ile Lys Glu Leu Arg Asp Leu Met Ser Gln Ser Arg Thr
1 5 10 15

Arg Glu Ile Leu Thr Lys Thr Thr Val Asp His Met Ala Ile Ile Lys
20 25 30

Lys Tyr Thr Ser Gly Arg Gln Glu Lys Asn Pro Ala Leu Arg Met Lys
35 40 45

Trp Met Met Ala Met Lys Tyr Pro Ile Thr Ala Asp Lys Arg Ile Met
50 55 60

Glu Met Ile Pro Glu Arg Asn Glu Gln Gly Gln Thr Leu Trp Ser Lys
65 70 75 80

Thr Asn Asp Ala Gly Ser Asp Arg Val Met Val Ser Pro Leu Ala Val
85 90 95

Thr Trp Trp Asn Arg Asn Gly Pro Thr Thr Ser Thr Ile His Tyr Pro
100 105 110

Lys Val Tyr Lys Thr Tyr Phe Glu Lys Val Glu Arg Leu Lys His Gly
115 120 125

Thr Phe Gly Pro Val His Phe Arg Asn Gln Val Lys Ile Arg Arg Arg

130

135

140

Val Asp Val Asn Pro Gly His Ala Asp Leu Ser Ala Lys Glu Ala Gln
 145 150 155 160

Asp Val Ile Met Glu Val Val Phe Pro Asn Glu Val Gly Ala Arg Ile
 165 170 175

Leu Thr Ser Glu Ser Gln Leu Thr Ile Thr Lys Glu Lys Lys Glu Glu
 180 185 190

Leu Gln Asp Cys Lys Ile Ala Pro Leu Met Val Ala Tyr Met Leu Glu
 195 200 205

Arg Glu Leu Val Arg Lys Thr Arg Phe Leu Pro Val Ala Gly Gly Thr
 210 215 220

Ser Ser Val Tyr Ile Glu Val Leu His Leu Thr Gln Gly Thr Cys Trp
 225 230 235 240

Glu Gln Met Tyr Thr Pro Gly Gly Glu Val Arg Asn Asp Asp Ile Asp
 245 250 255

Gln Ser Leu Ile Ile Ala Ala Arg Asn Ile Val Arg Arg Ala Thr Val
 260 265 270

Ser Ala Asp Pro Leu Ala Ser Leu Leu Glu Met Cys His Ser Thr Gln
 275 280 285

Ile Gly Gly Ile Arg Met Val Asp Ile Leu Lys Gln Asn Pro Thr Glu
 290 295 300

Glu Gln Ala Val Asp Ile Cys Lys Ala Ala Met Gly Leu Arg Ile Ser
 305 310 315 320

Ser Ser Phe Ser Phe Gly Gly Phe Thr Phe Lys Arg Thr Ser Gly Ser
 325 330 335

Ser Val Lys Arg Glu Glu Glu Met Leu Thr Gly Asn Leu Gln Thr Leu
 340 345 350

Lys Ile Arg Val His Glu Gly Tyr Glu Glu Phe Thr Met Val Gly Arg
 355 360 365

EQ-1-C2-1.ST25.txt

Arg Ala Thr Ala Ile Leu Arg Lys Ala Thr Arg Arg Leu Ile Gln Leu
 370 375 380

Ile Val Ser Gly Arg Asp Glu Gln Ser Ile Ala Glu Ala Ile Ile Val
 385 390 395 400

Ala Met Val Phe Ser Gln Glu Asp Cys Met Ile Lys Ala Val Arg Gly
 405 410 415

Asp Leu Asn Phe Val Asn Arg Ala Asn Gln Arg Leu Asn Pro Met His
 420 425 430

Gln Leu Leu Arg His Phe Gln Lys Asp Ala Lys Val Leu Phe Gln Asn
 435 440 445

Trp Gly Ile Glu Pro Ile Asp Asn Val Met Gly Met Ile Gly Ile Leu
 450 455 460

Pro Asp Met Thr Pro Ser Thr Glu Met Ser Leu Arg Gly Val Arg Val
 465 470 475 480

Ser Lys Met Gly Val Asp Glu Tyr Ser Ser Thr Glu Arg Val Val Val
 485 490 495

Ser Ile Asp Arg Phe Leu Arg Val Arg Asp Gln Arg Gly Asn Ile Leu
 500 505 510

Leu Ser Pro Glu Glu Val Ser Glu Thr Gln Gly Thr Glu Lys Leu Thr
 515 520 525

Ile Ile Tyr Ser Ser Ser Met Met Trp Glu Ile Asn Gly Pro Glu Ser
 530 535 540

Val Leu Val Asn Thr Tyr Gln Trp Ile Ile Arg Asn Trp Glu Ile Val
 545 550 555 560

Lys Ile Gln Trp Ser Gln Asp Pro Thr Met Leu Tyr Asn Lys Ile Glu
 565 570 575

Phe Glu Pro Phe Gln Ser Leu Val Pro Arg Ala Thr Arg Ser Gln Tyr
 580 585 590

Ser Gly Phe Val Arg Thr Leu Phe Gln Gln Met Arg Asp Val Leu Gly
 595 600 605

EQ-1-C2-1.ST25.txt

Thr Phe Asp Thr Ala Gln Ile Ile Lys Leu Leu Pro Phe Ala Ala Ala
610 615 620

Pro Pro Glu Gln Ser Arg Met Gln Phe Ser Ser Leu Thr Val Asn Val
625 630 635 640

Arg Gly Ser Gly Met Arg Ile Leu Val Arg Gly Asn Ser Pro Val Phe
645 650 655

Asn Tyr Asn Lys Ala Thr Lys Arg Leu Thr Val Leu Gly Lys Asp Ala
660 665 670

Gly Ala Leu Thr Glu Asp Pro Asp Glu Gly Thr Ala Gly Val Glu Ser
675 680 685

Ala Val Leu Arg Gly Phe Leu Ile Leu Gly Lys Glu Asn Lys Arg Tyr
690 695 700

Gly Pro Ala Leu Ser Ile Asn Glu Leu Ser Lys Leu Ala Lys Gly Glu
705 710 715 720

Lys Ala Asn Val Leu Ile Gly Gln Gly Asp Val Val Leu Val Met Lys
725 730 735

Arg Lys Arg Asp Ser Ser Ile Leu Thr Asp Ser Gln Thr Ala Thr Lys
740 745 750

Arg Ile Arg Met Ala Ile Asn
755

<210> 46
<211> 2277
<212> DNA
<213> Equine influenza virus H3N8

<400> 46
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acaaaaacta ctgtggacca catggccata atcaagaaat acacatcagg aagacaagag 120
aagaacccccg cacttaggat gaagtggatg atggcaatga aatacccaat tacagcagat 180
aagaggataa tggaaatgat tcctgagaga aatgaacagg ggcaaaccct ttggagcaaa 240
acgaacgatg ctggctcaga ccgcgtaatg gtatcacctc tggcagtgac atggtggaat 300
aggaatggac caacaacgag cacaattcat tatccaaaag tctacaaaac ttattttgaa 360

EQ-1-C2-1.ST25.txt

aaagttgaaa gattaaaaca cggaaccttt ggccccgttc attttaggaa tcaagtcaag	420
ataagacgga gagttgatgt aaaccttggg cagcgggacc tcagtgccaa agaagcacia	480
gatgtgatca tggaagttgt tttcccaaatt gaagtgggag ccagaattct aacatcgga	540
tcacaactaa caataaccaa agagaaaaaa gaagaacttc aggactgcaa aattgcccc	600
ttgatggttag catacatgct agaaagagag ttggtccgaa aaacaagatt cctcccagt	660
gctggcgga caagcagtgt atacattgaa gtgttgcatc tgactcaggg aacatgctgg	720
gaacaaatgt acaccccagg aggagaagtt agaaacgatg acattgatca aagtttaatt	780
attgctgccc ggaacatagt gagaagagcg acagtatcag cagatccact agcatccctg	840
ctggaaatgt gccacagtac acagattggg ggaataagga tggtagacat ccttaagcag	900
aatccaacag aggaacaagc tgtggatata tgcaaagcag caatgggggtt aagaattagc	960
tcatcattca gctttggtgg attcaccttt aagagaacaa gtggatcatc agtcaagaga	1020
gaagaagaaa tgcttacggg caaccttcaa acattgaaaa taagagtgca tgaaggctat	1080
gaagaattca caatggctcg aagaagagca acagccattc tcagaaaggc aaccagaaga	1140
ttgattcaat tgatagtaag tgggagagat gaacaatcaa ttgctgaagc aataattgta	1200
gccatggtgt tttcgcaaga agattgcatg ataaaagcag ttcgaggcga tttgaacttc	1260
gttaatagag caaatcagcg cttgaacccc atgcatcaac tcttgaggca tttccaaaaa	1320
gatgcaaaag tgcttttcca gaattggggg attgaaccca tcgacaatgt gatgggaatg	1380
attggaatat tgcttgacat gacccaagc accgagatgt cattgagagg agtgagagtc	1440
agcaaatgg gagtgatga gtactccagc actgagagag tgggtggtgag cattgaccgt	1500
tttttaagag ttcgggatca aaggggaaac atactactgt ccctgaaga ggtcagtga	1560
acacaaggaa cggaagagct gacaataatt tattcatcat caatgatgtg ggagattaat	1620
ggtcccgaat cagtgttgg caatacttat caatggatca tcaggaactg ggaaattgtg	1680
aaaattcaat ggtcacagga tcccacaatg ttatacaata agatagaatt tgagccattc	1740
cagtccctgg tccctagggc caccagaagc caatacagcg gtttcgtaag aacctgttt	1800
cagcaaatgc gagatgtact tggaacattt gatactgctc aaataataaa actcctccct	1860
tttgccgctg ctctccgga acagagtagg atgcagttct cttctttgac tgtaaatgta	1920
agaggatcgg gaatgaggat acttgtaaga ggcaattccc cagtgttcaa ctacaataaa	1980
gccactaaga ggctcacagt cctcggaag gatgcaggtg cgcttactga agaccagat	2040
gaaggtacgg ctggagtaga atctgctgtt ctaagagggt ttctcatttt aggtaaagaa	2100
aacaagagat atggcccagc actaagcatc aatgaactga gcaaacttgc aaaaggggag	2160

EQ-1-C2-1.ST25.txt

aaagctaattg tgctaattgg gcaaggggac gtggtgttgg taatgaaacg gaaacgtgac 2220
tctagcatac ttactgacag ccagacagcg accaaaagga ttcggatggc catcaat 2277

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<210> 47
<211> 2341
<212> DNA
<213> Equine influenza virus H3N8
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<220>
<221> CDS
<222> (28) .. (2304)
<223>
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<400> 47
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                               Met Glu Arg Ile Lys Glu Leu Arg Asp
                               1               5

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cta atg tca caa tcc cgc acc cgc gag ata cta aca aaa act act gtg 102
Leu Met Ser Gln Ser Arg Thr Arg Glu Ile Leu Thr Lys Thr Thr Val
10 15 20 25

gac cac atg gcc ata atc aag aaa tac aca tca gga aga caa gag aag 150
Asp His Met Ala Ile Ile Lys Lys Tyr Thr Ser Gly Arg Gln Glu Lys
30 35 40

aac ccc gca ctt agg atg aag tgg atg atg gca atg aaa tac cca att 198
Asn. Pro Ala Leu Arg Met Lys Trp Met Met Ala Met Lys Tyr Pro Ile
45 50 55

aca gca gat aag agg ata atg gaa atg att cct gag aga aat gaa cag 246
Thr Ala Asp Lys Arg Ile Met Glu Met Ile Pro Glu Arg Asn Glu Gln
60 65 70

ggg caa acc ctt tgg agc aaa acg aac gat gct ggc tca gac cgc gta 294
Gly Gln Thr Leu Trp Ser Lys Thr Asn Asp Ala Gly Ser Asp Arg Val
75 80 85

atg gta tca cct ctg gca gtg aca tgg tgg aat agg aat gga cca aca 342
Met Val Ser Pro Leu Ala Val Thr Trp Trp Asn Arg Asn Gly Pro Thr
90 95 100 105

acg agc aca att cat tat cca aaa gtc cac aaa act tat ttt gaa aaa 390
Thr Ser Thr Ile His Tyr Pro Lys Val His Lys Thr Tyr Phe Glu Lys
110 115 120

ggt gaa aga tta aaa cac gga acc ttt ggc ccc gtt cat ttt agg aat 438
Val Glu Arg Leu Lys His Gly Thr Phe Gly Pro Val His Phe Arg Asn
125 130 135

caa gtc aag ata aga cgg aga gtt gat gta aac cct ggt cac gcg gac 486
Gln Val Lys Ile Arg Arg Arg Val Asp Val Asn Pro Gly His Ala Asp
140 145 150

ctc agt gcc aaa gaa gca caa gat gtg atc atg gaa gtt gtt ttc cca 534

EQ-1-C2-1.ST25.txt

Leu Ser Ala Lys Glu Ala Gln Asp Val Ile Met Glu Val Val Phe Pro	
155 160 165	
aat gaa gtg gga gcc aga att cta aca tcg gaa tca caa cta aca ata	582
Asn Glu Val Gly Ala Arg Ile Leu Thr Ser Glu Ser Gln Leu Thr Ile	
170 175 180 185	
acc aaa gag aaa aaa gaa gaa ctt cag gac tgc aaa att gcc ccc ttg	630
Thr Lys Glu Lys Lys Glu Glu Leu Gln Asp Cys Lys Ile Ala Pro Leu	
190 195 200	
atg gta gca tac atg cta gaa aga gag ttg gtc cga aaa aca aga ttc	678
Met Val Ala Tyr Met Leu Glu Arg Glu Leu Val Arg Lys Thr Arg Phe	
205 210 215	
ctc cca gtg gct ggc gga aca agc agt gta tac att gaa gtg ttg cat	726
Leu Pro Val Ala Gly Gly Thr Ser Ser Val Tyr Ile Glu Val Leu His	
220 225 230	
ctg act cag gga aca tgc tgg gaa caa atg tac acc cca gga gga gaa	774
Leu Thr Gln Gly Thr Cys Trp Glu Gln Met Tyr Thr Pro Gly Gly Glu	
235 240 245	
gtt aga aac gat gac att gat caa agt tta att att gct gcc cgg aac	822
Val Arg Asn Asp Asp Ile Asp Gln Ser Leu Ile Ile Ala Ala Arg Asn	
250 255 260 265	
ata gtg aga aga gcg aca gta tca gca gat cca cta gca tcc ctg ctg	870
Ile Val Arg Arg Ala Thr Val Ser Ala Asp Pro Leu Ala Ser Leu Leu	
270 275 280	
gaa atg tgc cac agt aca cag att ggt gga ata agg atg gta gac atc	918
Glu Met Cys His Ser Thr Gln Ile Gly Gly Ile Arg Met Val Asp Ile	
285 290 295	
ctt aag cag aat cca aca gag gaa caa gct gtg gat ata tgc aaa gca	966
Leu Lys Gln Asn Pro Thr Glu Glu Gln Ala Val Asp Ile Cys Lys Ala	
300 305 310	
gca atg ggg tta aga att agc tca tca ttc agc ttt ggt gga ttc acc	1014
Ala Met Gly Leu Arg Ile Ser Ser Ser Phe Ser Phe Gly Gly Phe Thr	
315 320 325	
ttt aag aga aca agt gga tca tca gtc aag aga gaa gaa gaa atg ctt	1062
Phe Lys Arg Thr Ser Gly Ser Ser Val Lys Arg Glu Glu Glu Met Leu	
330 335 340 345	
acg ggc aac ctt caa aca ttg aaa ata aga gtg cat gaa ggc tat gaa	1110
Thr Gly Asn Leu Gln Thr Leu Lys Ile Arg Val His Glu Gly Tyr Glu	
350 355 360	
gaa ttc aca atg gtc gga aga aga gca aca gcc att ctc aga aag gca	1158
Glu Phe Thr Met Val Gly Arg Arg Ala Thr Ala Ile Leu Arg Lys Ala	
365 370 375	
acc aga aga ttg att caa ttg ata gta agt ggg aga gat gaa caa tca	1206
Thr Arg Arg Leu Ile Gln Leu Ile Val Ser Gly Arg Asp Glu Gln Ser	
380 385 390	

EQ-1-C2-1.ST25.txt

att gct gaa gca ata att gta gcc atg gtg ttt tcg caa gaa gat tgc Ile Ala Glu Ala Ile Ile Val Ala Met Val Phe Ser Gln Glu Asp Cys 395 400 405	1254
atg ata caa gca gtt cga ggc gat ttg aac ttc gtt aat aga gca aat Met Ile Gln Ala Val Arg Gly Asp Leu Asn Phe Val Asn Arg Ala Asn 410 415 420 425	1302
cag cgc ttg aac ccc atg cat caa ctc ttg agg cat ttc caa aaa gat Gln Arg Leu Asn Pro Met His Gln Leu Leu Arg His Phe Gln Lys Asp 430 435 440	1350
gca aaa gtg ctt ttc cag aat tgg ggg att gaa ccc atc gac aat gtg Ala Lys Val Leu Phe Gln Asn Trp Gly Ile Glu Pro Ile Asp Asn Val 445 450 455	1398
atg gga atg att gga ata ttg cct gac atg acc cca agc acc gag atg Met Gly Met Ile Gly Ile Leu Pro Asp Met Thr Pro Ser Thr Glu Met 460 465 470	1446
tca ttg aga gga gtg aga gtc agc aaa atg gga gtg gat gag tac tcc Ser Leu Arg Gly Val Arg Val Ser Lys Met Gly Val Asp Glu Tyr Ser 475 480 485	1494
agc act gag aga gtg gtg gtg agc att gac cgt ttt tta aga gtt cgg Ser Thr Glu Arg Val Val Val Ser Ile Asp Arg Phe Leu Arg Val Arg 490 495 500 505	1542
gat caa agg gga aac ata cta ctg tcc cct gaa gag gtc agt gaa aca Asp Gln Arg Gly Asn Ile Leu Leu Ser Pro Glu Glu Val Ser Glu Thr 510 515 520	1590
caa gga acg gaa aag ctg aca ata att tat tca tca tca atg atg tgg Gln Gly Thr Glu Lys Leu Thr Ile Ile Tyr Ser Ser Ser Met Met Trp 525 530 535	1638
gag att aat ggt ccc gaa tca gtg ttg gtc aat act tat caa tgg atc Glu Ile Asn Gly Pro Glu Ser Val Leu Val Asn Thr Tyr Gln Trp Ile 540 545 550	1686
atc agg aac tgg gaa att gtg aaa att caa tgg tca cag gat ccc aca Ile Arg Asn Trp Glu Ile Val Lys Ile Gln Trp Ser Gln Asp Pro Thr 555 560 565	1734
atg tta tac aat aag ata gaa ttt gag cca ttc cag tcc ctg gtc cct Met Leu Tyr Asn Lys Ile Glu Phe Glu Pro Phe Gln Ser Leu Val Pro 570 575 580 585	1782
agg gcc acc aga agc caa tac agc ggt ttc gta aga acc ctg ttt cag Arg Ala Thr Arg Ser Gln Tyr Ser Gly Phe Val Arg Thr Leu Phe Gln 590 595 600	1830
caa atg cga gat gta ctt gga aca ttt gat act gct caa ata ata aaa Gln Met Arg Asp Val Leu Gly Thr Phe Asp Thr Ala Gln Ile Ile Lys 605 610 615	1878
ctc ctc cct ttt gcc gct gct cct ccg gaa cag agt agg atg cag ttc Leu Leu Pro Phe Ala Ala Ala Pro Pro Glu Gln Ser Arg Met Gln Phe 620 625 630	1926

EQ-1-C2-1.ST25.txt

tct tct ttg act gtt aat gta aga gga tgc gga atg agg ata ctt gta 1974
 Ser Ser Leu Thr Val Asn Val Arg Gly Ser Gly Met Arg Ile Leu Val
 635 640 645
 aga ggc aat tcc cca gtg ttc aac tac aat aaa gcc act aag agg ctc 2022
 Arg Gly Asn Ser Pro Val Phe Asn Tyr Asn Lys Ala Thr Lys Arg Leu
 650 655 660 665
 aca gtc ctc gga aaa gat gca ggt gcg ctt act gaa gac cca gat gaa 2070
 Thr Val Leu Gly Lys Asp Ala Gly Ala Leu Thr Glu Asp Pro Asp Glu
 670 675 680
 ggt acg gct gga gta gaa tct gct gtt cta aga ggg ttt ctc att tta 2118
 Gly Thr Ala Gly Val Glu Ser Ala Val Leu Arg Gly Phe Leu Ile Leu
 685 690 695
 ggt aaa gaa aac aag aga tat ggc cca gca cta agc atc aat gaa ctg 2166
 Gly Lys Glu Asn Lys Arg Tyr Gly Pro Ala Leu Ser Ile Asn Glu Leu
 700 705 710
 agc aaa ctt gca aaa ggg gag aaa gct aat gtg cta att ggg caa ggg 2214
 Ser Lys Leu Ala Lys Gly Glu Lys Ala Asn Val Leu Ile Gly Gln Gly
 715 720 725
 gac gtg gtg ttg gta atg aaa cgg aaa cgt gac tct agc ata ctt act 2262
 Asp Val Val Leu Val Met Lys Arg Lys Arg Asp Ser Ser Ile Leu Thr
 730 735 740 745
 gac agc cag aca gcg acc aaa agg att cgg atg gcc atc aat 2304
 Asp Ser Gln Thr Ala Thr Lys Arg Ile Arg Met Ala Ile Asn
 750 755
 tagtggtgaa ttgttttaaaa acgaccttgt ttctact 2341

<210> 48
 <211> 759
 <212> PRT
 <213> Equine influenza virus H3N8
 <400> 48

Met Glu Arg Ile Lys Glu Leu Arg Asp Leu Met Ser Gln Ser Arg Thr
1 5 10 15

Arg Glu Ile Leu Thr Lys Thr Thr Val Asp His Met Ala Ile Ile Lys
20 25 30

Lys Tyr Thr Ser Gly Arg Gln Glu Lys Asn Pro Ala Leu Arg Met Lys
35 40 45

Trp Met Met Ala Met Lys Tyr Pro Ile Thr Ala Asp Lys Arg Ile Met
50 55 60

EQ-1-C2-1.ST25.txt

Glu Met Ile Pro Glu Arg Asn Glu Gln Gly Gln Thr Leu Trp Ser Lys
65 70 75 80

Thr Asn Asp Ala Gly Ser Asp Arg Val Met Val Ser Pro Leu Ala Val
85 90 95

Thr Trp Trp Asn Arg Asn Gly Pro Thr Thr Ser Thr Ile His Tyr Pro
100 105 110

Lys Val His Lys Thr Tyr Phe Glu Lys Val Glu Arg Leu Lys His Gly
115 120 125

Thr Phe Gly Pro Val His Phe Arg Asn Gln Val Lys Ile Arg Arg Arg
130 135 140

Val Asp Val Asn Pro Gly His Ala Asp Leu Ser Ala Lys Glu Ala Gln
145 150 155 160

Asp Val Ile Met Glu Val Val Phe Pro Asn Glu Val Gly Ala Arg Ile
165 170 175

Leu Thr Ser Glu Ser Gln Leu Thr Ile Thr Lys Glu Lys Lys Glu Glu
180 185 190

Leu Gln Asp Cys Lys Ile Ala Pro Leu Met Val Ala Tyr Met Leu Glu
195 200 205

Arg Glu Leu Val Arg Lys Thr Arg Phe Leu Pro Val Ala Gly Gly Thr
210 215 220

Ser Ser Val Tyr Ile Glu Val Leu His Leu Thr Gln Gly Thr Cys Trp
225 230 235 240

Glu Gln Met Tyr Thr Pro Gly Gly Glu Val Arg Asn Asp Asp Ile Asp
245 250 255

Gln Ser Leu Ile Ile Ala Ala Arg Asn Ile Val Arg Arg Ala Thr Val
260 265 270

Ser Ala Asp Pro Leu Ala Ser Leu Leu Glu Met Cys His Ser Thr Gln
275 280 285

Ile Gly Gly Ile Arg Met Val Asp Ile Leu Lys Gln Asn Pro Thr Glu
290 295 300

EQ-1-C2-1.ST25.txt

Glu Gln Ala Val Asp Ile Cys Lys Ala Ala Met Gly Leu Arg Ile Ser
 305 310 315 320

Ser Ser Phe Ser Phe Gly Gly Phe Thr Phe Lys Arg Thr Ser Gly Ser
 325 330 335

Ser Val Lys Arg Glu Glu Glu Met Leu Thr Gly Asn Leu Gln Thr Leu
 340 345 350

Lys Ile Arg Val His Glu Gly Tyr Glu Glu Phe Thr Met Val Gly Arg
 355 360 365

Arg Ala Thr Ala Ile Leu Arg Lys Ala Thr Arg Arg Leu Ile Gln Leu
 370 375 380

Ile Val Ser Gly Arg Asp Glu Gln Ser Ile Ala Glu Ala Ile Ile Val
 385 390 395 400

Ala Met Val Phe Ser Gln Glu Asp Cys Met Ile Gln Ala Val Arg Gly
 405 410 415

Asp Leu Asn Phe Val Asn Arg Ala Asn Gln Arg Leu Asn Pro Met His
 420 425 430

Gln Leu Leu Arg His Phe Gln Lys Asp Ala Lys Val Leu Phe Gln Asn
 435 440 445

Trp Gly Ile Glu Pro Ile Asp Asn Val Met Gly Met Ile Gly Ile Leu
 450 455 460

Pro Asp Met Thr Pro Ser Thr Glu Met Ser Leu Arg Gly Val Arg Val
 465 470 475 480

Ser Lys Met Gly Val Asp Glu Tyr Ser Ser Thr Glu Arg Val Val Val
 485 490 495

Ser Ile Asp Arg Phe Leu Arg Val Arg Asp Gln Arg Gly Asn Ile Leu
 500 505 510

Leu Ser Pro Glu Glu Val Ser Glu Thr Gln Gly Thr Glu Lys Leu Thr
 515 520 525

Ile Ile Tyr Ser Ser Ser Met Met Trp Glu Ile Asn Gly Pro Glu Ser
 530 535 540

Val Leu Val Asn Thr Tyr Gln Trp Ile Ile Arg Asn Trp Glu Ile Val
 545 550 555 560

Lys Ile Gln Trp Ser Gln Asp Pro Thr Met Leu Tyr Asn Lys Ile Glu
 565 570 575

Phe Glu Pro Phe Gln Ser Leu Val Pro Arg Ala Thr Arg Ser Gln Tyr
 580 585 590

Ser Gly Phe Val Arg Thr Leu Phe Gln Gln Met Arg Asp Val Leu Gly
 595 600 605

Thr Phe Asp Thr Ala Gln Ile Ile Lys Leu Leu Pro Phe Ala Ala Ala
 610 615 620

Pro Pro Glu Gln Ser Arg Met Gln Phe Ser Ser Leu Thr Val Asn Val
 625 630 635 640

Arg Gly Ser Gly Met Arg Ile Leu Val Arg Gly Asn Ser Pro Val Phe
 645 650 655

Asn Tyr Asn Lys Ala Thr Lys Arg Leu Thr Val Leu Gly Lys Asp Ala
 660 665 670

Gly Ala Leu Thr Glu Asp Pro Asp Glu Gly Thr Ala Gly Val Glu Ser
 675 680 685

Ala Val Leu Arg Gly Phe Leu Ile Leu Gly Lys Glu Asn Lys Arg Tyr
 690 695 700

Gly Pro Ala Leu Ser Ile Asn Glu Leu Ser Lys Leu Ala Lys Gly Glu
 705 710 715 720

Lys Ala Asn Val Leu Ile Gly Gln Gly Asp Val Val Leu Val Met Lys
 725 730 735

Arg Lys Arg Asp Ser Ser Ile Leu Thr Asp Ser Gln Thr Ala Thr Lys
 740 745 750

Arg Ile Arg Met Ala Ile Asn
 755

<210> 49

<211> 2277

<212> DNA

<213> Equine influenza virus H3N8

<400> 49

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acaaaaacta ctgtggacca catggccata atcaagaaat acacatcagg aagacaagag	120
aagaaccccc cacttaggat gaagtggatg atggcaatga aatacccaat tacagcagat	180
aagaggataa tggaaatgat tcctgagaga aatgaacagg ggcaaaccct ttggagcaaa	240
acgaacgatg ctggctcaga ccgcgtaatg gtatcacctc tggcagtgac atggtggaat	300
aggaatggac caacaacgag cacaattcat tatccaaaag tccacaaaac ttattttgaa	360
aaagttgaaa gattaaaaca cggaaccttt ggccccgttc attttaggaa tcaagtcaag	420
ataagacgga gagttgatgt aaacctggt cacgcggacc tcagtgccaa agaagcacia	480
gatgtgatca tggaagtgt tttcccaa atgaagtgagg ccagaattct aacatcggaa	540
tcacaactaa caataaccaa agagaaaaaa gaagaacttc aggactgcaa aattgcccc	600
ttgatggtag catacatgct agaaagagag ttggtccgaa aaacaagatt cctcccagtg	660
gctggcggaa caagcagtgt atacattgaa gtgttgcatc tgactcaggg aacatgctgg	720
gaacaaatgt acaccccagg aggagaagtt agaaacgatg acattgatca aagtttaatt	780
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ctggaaatgt gccacagtac acagattggt ggaataagga tggtagacat ccttaagcag	900
aatccaacag aggaacaagc tgtggatata tgcaaagcag caatgggggt aagaattagc	960
tcattcattca gctttggtgg attcaccttt aagagaacaa gtggatcatc agtcaagaga	1020
gaagaagaaa tgcttacggg caaccttcaa acattgaaaa taagagtgc tgaaggctat	1080
gaagaattca caatggtcgg aagaagagca acagccattc tcagaaaggc aaccagaaga	1140
ttgattcaat tgatagtaag tgggagagat gaacaatcaa ttgctgaagc aataattgta	1200
gccatggtgt tttcgcaaga agattgcatg atacaagcag ttcgaggcga tttgaacttc	1260
gttaatatagag caaatcagcg cttgaacccc atgcatcaac tcttgaggca tttccaaaaa	1320
gatgcaaaag tgcttttcca gaattggggg attgaacca tcgacaatgt gatgggaatg	1380
attggaatat tgctgacat gacccaagc accgagatgt cattgagagg agtgagagtc	1440
agcaaaatgg gagtggatga gtactccagc actgagagag tggtggtgag cattgaccgt	1500
tttttaagag ttcgggatca aaggggaaac atactactgt cccctgaaga ggtcagtga	1560
acacaaggaa cggaaaagct gacaataatt tattcatcat caatgatgtg ggagattaat	1620

EQ-1-C2-1.ST25.txt

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gggtcccgaaat cagtgttggt caatacttat caatggatca tcaggaactg ggaaattgtg 1680
aaaattcaat ggtcacagga tcccacaatg ttatacaata agatagaatt tgagccattc 1740
cagtcctctgg tccctagggc caccagaagc caatacagcg gtttcgtaag aaccctgttt 1800
cagcaaatgc gagatgtact tggaacattt gatactgctc aaataataaa actcctccct 1860
tttgccgctg ctctccgga acagagtagg atgcagttct cttctttgac tgttaatgta 1920
agaggatcgg gaatgaggat acttgtaaga ggcaattccc cagtgttcaa ctacaataaa 1980
gccactaaga gggtcacagt cctcggaata gatgcaggtg cgcttactga agaccagat 2040
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aacaagagat atggccagc actaagcatc aatgaactga gcaaacttgc aaaaggggag 2160
aaagctaattg tgctaattgg gcaaggggac gtgggtgttg taatgaaacg gaaacgtgac 2220
tctagcatac ttactgacag ccagacagcg accaaaagga ttcggtggc catcaat 2277

```

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<210> 50
<211> 891
<212> DNA
<213> Equine influenza virus H3N8

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<220>
<221> CDS
<222> (27)..(716)
<223>

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Met Asp Ser Asn Thr Val Ser Ser Phe
1 5

cag gta gac tgt ttt ctt tgg cat gtc cgc aaa cga ttt gca gac caa 101
Gln Val Asp Cys Phe Leu Trp His Val Arg Lys Arg Phe Ala Asp Gln
10 15 20 25

gaa ctg ggt gat gcc cca ttc ctt gac cgg ctt cgc cga gac cag aag 149
Glu Leu Gly Asp Ala Pro Phe Leu Asp Arg Leu Arg Arg Asp Gln Lys
30 35 40

tcc cta aaa gga aga ggt agc act ctt ggt ctg gac atc gaa aca gcc 197
Ser Leu Lys Gly Arg Gly Ser Thr Leu Gly Leu Asp Ile Glu Thr Ala
45 50 55

act cgt gca gga aag cag ata gtg gag cag att ctg gaa gag gaa tca 245
Thr Arg Ala Gly Lys Gln Ile Val Glu Gln Ile Leu Glu Glu Glu Ser
60 65 70

gat gag gca ctt aaa atg acc att gcc tct gtt cct gct tca cgc tac 293
Asp Glu Ala Leu Lys Met Thr Ile Ala Ser Val Pro Ala Ser Arg Tyr
75 80 85

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EQ-1-C2-1.ST25.txt

tta act gac atg act ctt gat gag atg tca aga gac tgg ttc atg ctc 341
 Leu Thr Asp Met Thr Leu Asp Glu Met Ser Arg Asp Trp Phe Met Leu
 90 95 100 105

 atg ccc aag cag aaa gta aca ggc tcc cta tgt ata aga atg gac cag 389
 Met Pro Lys Gln Lys Val Thr Gly Ser Leu Cys Ile Arg Met Asp Gln
 110 115 120

 gca atc atg gat aag aac atc ata ctt aaa gca aac ttt agt gtg att 437
 Ala Ile Met Asp Lys Asn Ile Ile Leu Lys Ala Asn Phe Ser Val Ile
 125 130 135

 ttc gaa agg ctg gag aca cta ata cta ctt aga gcc ttc acc gaa gaa 485
 Phe Glu Arg Leu Glu Thr Leu Ile Leu Leu Arg Ala Phe Thr Glu Glu
 140 145 150

 gga gca gtc gtt ggc gaa att tca cca ttg cct tct ctt cca gga cat 533
 Gly Ala Val Val Gly Glu Ile Ser Pro Leu Pro Ser Leu Pro Gly His
 155 160 165

 act aat gag gat gtc aaa aat gca att ggg gtc ctc atc gga gga ctt 581
 Thr Asn Glu Asp Val Lys Asn Ala Ile Gly Val Leu Ile Gly Gly Leu
 170 175 180 185

 aaa tgg aat gat aat acg gtt aga atc tct gaa act cta cag aga ttc 629
 Lys Trp Asn Asp Asn Thr Val Arg Ile Ser Glu Thr Leu Gln Arg Phe
 190 195 200

 gct tgg aga agc agt cat gag aat ggg aga cct tca ttc cct cca aag 677
 Ala Trp Arg Ser Ser His Glu Asn Gly Arg Pro Ser Phe Pro Pro Lys
 205 210 215

 cag aaa cga aaa atg gag aga aca att gag cca gaa gtt tgaagaaata 726
 Gln Lys Arg Lys Met Glu Arg Thr Ile Glu Pro Glu Val
 220 225 230

 agatggttga ttgaagaagt ggcacataga ttgaaaaata cagaaaatag ttttgaacaa 786
 ataacattta tgcaagcctt acaactattg cttgaagtag gacaagagat aagaactttc 846
 tcgtttcagc ttatttaatg ataaaaaaca cccttgtttc tacta 891

<210> 51
 <211> 230
 <212> PRT
 <213> Equine influenza virus H3N8

<400> 51

Met Asp Ser Asn Thr Val Ser Ser Phe Gln Val Asp Cys Phe Leu Trp
 1 5 10 15

His Val Arg Lys Arg Phe Ala Asp Gln Glu Leu Gly Asp Ala Pro Phe
 20 25 30

Leu Asp Arg Leu Arg Arg Asp Gln Lys Ser Leu Lys Gly Arg Gly Ser

35

40

45

Thr Leu Gly Leu Asp Ile Glu Thr Ala Thr Arg Ala Gly Lys Gln Ile
 50 55 60

Val Glu Gln Ile Leu Glu Glu Glu Ser Asp Glu Ala Leu Lys Met Thr
 65 70 75 80

Ile Ala Ser Val Pro Ala Ser Arg Tyr Leu Thr Asp Met Thr Leu Asp
 85 90 95

Glu Met Ser Arg Asp Trp Phe Met Leu Met Pro Lys Gln Lys Val Thr
 100 105 110

Gly Ser Leu Cys Ile Arg Met Asp Gln Ala Ile Met Asp Lys Asn Ile
 115 120 125

Ile Leu Lys Ala Asn Phe Ser Val Ile Phe Glu Arg Leu Glu Thr Leu
 130 135 140

Ile Leu Leu Arg Ala Phe Thr Glu Glu Gly Ala Val Val Gly Glu Ile
 145 150 155 160

Ser Pro Leu Pro Ser Leu Pro Gly His Thr Asn Glu Asp Val Lys Asn
 165 170 175

Ala Ile Gly Val Leu Ile Gly Gly Leu Lys Trp Asn Asp Asn Thr Val
 180 185 190

Arg Ile Ser Glu Thr Leu Gln Arg Phe Ala Trp Arg Ser Ser His Glu
 195 200 205

Asn Gly Arg Pro Ser Phe Pro Pro Lys Gln Lys Arg Lys Met Glu Arg
 210 215 220

Thr Ile Glu Pro Glu Val
 225 230

<210> 52
 <211> 690
 <212> DNA
 <213> Equine influenza virus H3N8

<400> 52
 atggattcca acactgtgtc aagctttcag gtagactgtt ttctttggca tgtccgcaaa

60

EQ-1-C2-1.ST25.txt

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cgatttgcag accaagaact gggatgatgcc ccattccttg accggcttcg ccgagaccag 120
aagtccctaa aaggaagagg tagcactctt ggtctggaca tcgaaacagc cactcgtgca 180
ggaaagcaga tagtggagca gattctggaa gaggaatcag atgaggcact taaaatgacc 240
attgcctctg ttcttgcttc acgctactta actgacatga ctcttgatga gatgtcaaga 300
gactggttca tgctcatgcc caagcagaaa gtaacaggct ccctatgtat aagaatggac 360
caggcaatca tggataagaa catcatactt aaagcaaact ttagtgtgat tttcgaaagg 420
ctggagacac taatactact tagagccttc accgaagaag gagcagtcgt tggcgaaatt 480
tcaccattgc cttctcttcc aggacatact aatgaggatg tcaaaaatgc aattggggtc 540
ctcatcggag gacttaaattg gaatgataat acggttagaa tctctgaaac tctacagaga 600
ttcgcttgga gaagcagtca tgagaatggg agaccttcat tccctccaaa gcagaaacga 660
aaaatggaga gaacaattga gccagaagtt 690

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```

<210> 53
<211> 888
<212> DNA
<213> Equine influenza virus H3N8

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<400> 53
caaaagcagg gtgacaaaaa catgatggat tccaacactg tgtcaagctt tcaggtagac 60
tgttttcttt ggcattgtcg caaacgattt gcagaccaag aactgggtga tgccccattc 120
cttgaccggc ttcgccgaga ccagaagtcc ctaaaaggaa gaggtagcac tcttggtctg 180
gacatcgaaa cagccactcg tgcaggaaag cagatagtgg agcagattct ggaagaggaa 240
tcagatgagg cacttaaaat gaccattgcc tctgttctcg cttcacgcta ctttaactgac 300
atgactcttg atgagatgtc aagagactgg ttcattgtca tgcccaagca gaaagtaaca 360
ggctccctat gtataagaat ggaccaggca atcatggata agaacatcat acttaaagca 420
aacttttagt tgattttcga aaggctggag acactaatac tacttagagc cttcaccgaa 480
gaaggagcag tcgttggcga aatttcacca ttgccttctc ttccaggaca tactaatgag 540
gatgtcaaaa atgcaattgg ggtcctcatc ggaggactta aatggaatga taatacggtt 600
agaatctctg aaactctaca gagattcgct tggagaagca gtcattgaga tgggagacct 660
tcattccctc caaagcagaa acgaaaaatg gagagaacaa ttgagccaga agtttgaaga 720
aataagatgg ttgattgaag aagtgcgaca tagattgaaa aatacagaaa atagttttga 780
acaaataaca tttatgcaag ccttacaact attgcttgaa gtagaacaag agataagaac 840
tttctcgttt cagcttattt aatgataaaa aacacccttg tttctact 888

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<210> 54
 <211> 468
 <212> DNA
 <213> Equine influenza virus H3N8

<220>
 <221> CDS
 <222> (3)..(293)
 <223>

<400> 54
 ac ttt agt gtg att ttc gaa agg ctg gag aca cta ata cta ctt aga 47
 Phe Ser Val Ile Phe Glu Arg Leu Glu Thr Leu Ile Leu Leu Arg
 1 5 10 15
 gcc ttc acc gaa gaa gga gca gtc gtt ggc gaa att tca cca ttg cct 95
 Ala Phe Thr Glu Glu Gly Ala Val Val Gly Glu Ile Ser Pro Leu Pro
 20 25 30
 tct ctt cca gga cat act aat gag gat gtc aaa aat gca att ggg gtc 143
 Ser Leu Pro Gly His Thr Asn Glu Asp Val Lys Asn Ala Ile Gly Val
 35 40 45
 ctc atc gga gga ctt aaa tgg aat gat aat acg gtt aga atc tct gaa 191
 Leu Ile Gly Gly Leu Lys Trp Asn Asp Asn Thr Val Arg Ile Ser Glu
 50 55 60
 act cta cag aga ttc gct cgg aga agc agt cat gag aat ggg aga cct 239
 Thr Leu Gln Arg Phe Ala Arg Arg Ser Ser His Glu Asn Gly Arg Pro
 65 70 75
 tca ttc cct cca aag cag aaa cga aaa atg gag aga aca att gag cca 287
 Ser Phe Pro Pro Lys Gln Lys Arg Lys Met Glu Arg Thr Ile Glu Pro
 80 85 90 95
 gaa gtt tgaagaaata agatggttga ttgaagaagt gcgacataga ttgaaaaata 343
 Glu Val
 cagaaaaatag ttttgaacaa ataacattta tgcaagcctt acaactattg cttgaagtag 403
 aacaagagat aagaactttc tcgtttcagc ttattttaatg ataaaaaaca cccttggttc 463
 tacta 468

<210> 55
 <211> 97
 <212> PRT
 <213> Equine influenza virus H3N8

<400> 55
 Phe Ser Val Ile Phe Glu Arg Leu Glu Thr Leu Ile Leu Leu Arg Ala
 1 5 10 15

EQ-1-C2-1.ST25.txt

Phe Thr Glu Glu Gly Ala Val Val Gly Glu Ile Ser Pro Leu Pro Ser
20 25 30

Leu Pro Gly His Thr Asn Glu Asp Val Lys Asn Ala Ile Gly Val Leu
35 40 45

Ile Gly Gly Leu Lys Trp Asn Asp Asn Thr Val Arg Ile Ser Glu Thr
50 55 60

Leu Gln Arg Phe Ala Arg Arg Ser Ser His Glu Asn Gly Arg Pro Ser
65 70 75 80

Phe Pro Pro Lys Gln Lys Arg Lys Met Glu Arg Thr Ile Glu Pro Glu
85 90 95

Val

<210> 56
<211> 293
<212> DNA
<213> Equine influenza virus H3N8

<400> 56
acttttagtgt gatttttcgaa aggctggaga cactaatact acttagagcc ttcaccgaag 60
aaggagcagt cgttggcgaa atttcacccat tgccttctct tccaggacat actaatgagg 120
atgtcaaaaa tgcaattggg gtcctcatcg gaggacttaa atggaatgat aatacgggta 180
gaatctctga aactctacag agattcgctc ggagaagcag tcatgagaat gggagacctt 240
cattccctcc aaagcagaaa cgaaaaatgg agagaacaat tgagccagaa gtt 293

<210> 57
<211> 888
<212> DNA
<213> Equine influenza virus H3N8

<220>
<221> CDS
<222> (27)..(716)
<223>

<400> 57
agcaaaagca gggtgacaaa aacata atg gat tcc aac act gtg tca agc ttt 53
Met Asp Ser Asn Thr Val Ser Ser Phe
1 5

cag gta gac tgt ttt ctt tgg cat gtc cgc aaa cga ttt gca gac caa 101
Gln Val Asp Cys Phe Leu Trp His Val Arg Lys Arg Phe Ala Asp Gln

10	15	20	25	
gaa ctg ggt gat gcc cca ttc ctt gac cgg ctt cgc cga gac cag aag				149
Glu Leu Gly Asp Ala Pro Phe Leu Asp Arg Leu Arg Arg Asp Gln Lys	30	35	40	
tcc cta aaa gga aga ggt agc act ctt ggt ctg gac atc gaa aca gcc				197
Ser Leu Lys Gly Arg Gly Ser Thr Leu Gly Leu Asp Ile Glu Thr Ala	45	50	55	
act cgt gca gga aag cag ata gtg gag cag att ctg gaa gag gaa tca				245
Thr Arg Ala Gly Lys Gln Ile Val Glu Gln Ile Leu Glu Glu Glu Ser	60	65	70	
gat gag gca ctt aaa atg acc att gcc tct gtt cct gct tca cgc tac				293
Asp Glu Ala Leu Lys Met Thr Ile Ala Ser Val Pro Ala Ser Arg Tyr	75	80	85	
tta act gac atg act ctt gat gag atg tca aga gac tgg ttc atg ctc				341
Leu Thr Asp Met Thr Leu Asp Glu Met Ser Arg Asp Trp Phe Met Leu	90	95	100	105
atg ccc aag cag aaa gta aca ggc tcc cta tgt ata aga atg gac cag				389
Met Pro Lys Gln Lys Val Thr Gly Ser Leu Cys Ile Arg Met Asp Gln	110	115	120	
gca atc atg gat aag aac atc ata ctt aaa gca aac ttt agt gtg att				437
Ala Ile Met Asp Lys Asn Ile Ile Leu Lys Ala Asn Phe Ser Val Ile	125	130	135	
ttc gaa agg ctg gag aca cta ata cta ctt aga gcc ttc acc gaa gaa				485
Phe Glu Arg Leu Glu Thr Leu Ile Leu Leu Arg Ala Phe Thr Glu Glu	140	145	150	
gga gca gtc gtt ggc gaa att tca cca ttg cct tct ctt cca gga cat				533
Gly Ala Val Val Gly Glu Ile Ser Pro Leu Pro Ser Leu Pro Gly His	155	160	165	
act aat gag gat gtc aaa aat gca att ggg gtc ctc atc gga gga ctt				581
Thr Asn Glu Asp Val Lys Asn Ala Ile Gly Val Leu Ile Gly Gly Leu	170	175	180	185
aaa tgg aat gat aat acg gtt aga atc tct gaa act cta cag aga ttc				629
Lys Trp Asn Asp Asn Thr Val Arg Ile Ser Glu Thr Leu Gln Arg Phe	190	195	200	
gct tgg aga agc agt cat gag aat ggg aga cct tca ttc cct cca aag				677
Ala Trp Arg Ser Ser His Glu Asn Gly Arg Pro Ser Phe Pro Pro Lys	205	210	215	
cag aaa cga aaa atg gag aga aca att gag cca gaa gtt tgaagaaata				726
Gln Lys Arg Lys Met Glu Arg Thr Ile Glu Pro Glu Val	220	225	230	
agatggttga ttgaagaagt gcgacataga ttgaaaaata cagaaaatag ttttgaacaa				786
ataacattta tgcaagcctt acaactattg cttgaagtag aacaagagat aagaactttc				846
tcgtttcagc ttatttaatg ataaaaaaca cccttgtttc ta				888

<210> 58
 <211> 230
 <212> PRT
 <213> Equine influenza virus H3N8

<400> 58

Met Asp Ser Asn Thr Val Ser Ser Phe Gln Val Asp Cys Phe Leu Trp
 1 5 10 15

His Val Arg Lys Arg Phe Ala Asp Gln Glu Leu Gly Asp Ala Pro Phe
 20 25 30

Leu Asp Arg Leu Arg Arg Asp Gln Lys Ser Leu Lys Gly Arg Gly Ser
 35 40 45

Thr Leu Gly Leu Asp Ile Glu Thr Ala Thr Arg Ala Gly Lys Gln Ile
 50 55 60

Val Glu Gln Ile Leu Glu Glu Glu Ser Asp Glu Ala Leu Lys Met Thr
 65 70 75 80

Ile Ala Ser Val Pro Ala Ser Arg Tyr Leu Thr Asp Met Thr Leu Asp
 85 90 95

Glu Met Ser Arg Asp Trp Phe Met Leu Met Pro Lys Gln Lys Val Thr
 100 105 110

Gly Ser Leu Cys Ile Arg Met Asp Gln Ala Ile Met Asp Lys Asn Ile
 115 120 125

Ile Leu Lys Ala Asn Phe Ser Val Ile Phe Glu Arg Leu Glu Thr Leu
 130 135 140

Ile Leu Leu Arg Ala Phe Thr Glu Glu Gly Ala Val Val Gly Glu Ile
 145 150 155 160

Ser Pro Leu Pro Ser Leu Pro Gly His Thr Asn Glu Asp Val Lys Asn
 165 170 175

Ala Ile Gly Val Leu Ile Gly Gly Leu Lys Trp Asn Asp Asn Thr Val
 180 185 190

Arg Ile Ser Glu Thr Leu Gln Arg Phe Ala Trp Arg Ser Ser His Glu
 195 200 205

Asn Gly Arg Pro Ser Phe Pro Pro Lys Gln Lys Arg Lys Met Glu Arg
 210 215 220

Thr Ile Glu Pro Glu Val
 225 230

<210> 59
 <211> 690
 <212> DNA
 <213> Equine influenza virus H3N8

<400> 59
 atggattcca acactgtgtc aagctttcag gtagactggtt ttctttggca tgtccgcaaa 60
 cgatttgcag accaagaact gggatgatgcc ccattccttg accggcttcg ccgagaccag 120
 aagtccctaa aaggaagagg tagcactctt ggtctggaca tcgaaacagc cactcgtgca 180
 ggaaagcaga tagtggagca gattctggaa gaggaatcag atgaggcact taaaatgacc 240
 attgcctctg ttctgtcttc acgctactta actgacatga ctcttgatga gatgtcaaga 300
 gactgggttca tgctcatgcc caagcagaaa gtaacaggct ccctatgtat aagaatggac 360
 caggcaatca tggataagaa catcatactt aaagcaaact ttagtgtgat ttctcgaaagg 420
 ctggagacac taatactact tagagccttc accgaagaag gagcagtcgt tggcgaaatt 480
 tcaccattgc cttctcttcc aggacatact aatgaggatg tcaaaaatgc aattggggtc 540
 ctcatcggag gacttaaattg gaatgataat acggtttagaa tctctgaaac tctacagaga 600
 ttcgcttgga gaagcagtca tgagaatggg agaccttcat tccctccaaa gcagaaacga 660
 aaaatggaga gaacaattga gccagaagtt 690

<210> 60
 <211> 21
 <212> DNA
 <213> Artificial sequence

<220>
 <223> Synthetic Primer

<400> 60
 agcaaagcag gtgacaaaaa c 21

<210> 61
 <211> 19
 <212> DNA
 <213> Artificial sequence

<220>

<223> Synthetic Primer

<400> 61

agtagaaaca aggggtgttt

19

<210> 62

<211> 1229

<212> DNA

<213> Equine influenza virus H3N8

<220>

<221> CDS

<222> (36)..(1229)

<223>

<400> 62

gaattcggct tagcaaaagc aggcaaacta tttga atg gat gtc aat ccg act
 Met Asp Val Asn Pro Thr
 1 5

53

cta ctc ttc tta aag gtg cca gcg caa aat gct ata agc aca aca ttc
 Leu Leu Phe Leu Lys Val Pro Ala Gln Asn Ala Ile Ser Thr Thr Phe
 10 15 20

101

cct tat act gga gat cct ccc tac agt cat gga aca ggg aca gga tac
 Pro Tyr Thr Gly Asp Pro Pro Tyr Ser His Gly Thr Gly Thr Gly Tyr
 25 30 35

149

acc atg gat act gtc aac aga aca cat caa tac tca gaa aag ggg aaa
 Thr Met Asp Thr Val Asn Arg Thr His Gln Tyr Ser Glu Lys Gly Lys
 40 45 50

197

tgg aca aca aac act gag att gga gca cca caa ctt aat cca atc gat
 Trp Thr Thr Asn Thr Glu Ile Gly Ala Pro Gln Leu Asn Pro Ile Asp
 55 60 65 70

245

gga ccg ctt cct gaa gac aat gaa cca agt ggg tac gcc caa aca gat
 Gly Pro Leu Pro Glu Asp Asn Glu Pro Ser Gly Tyr Ala Gln Thr Asp
 75 80 85

293

tgt gta ttg gaa gca atg gct ttc ctt gaa gaa tcc cat ccc gga atc
 Cys Val Leu Glu Ala Met Ala Phe Leu Glu Glu Ser His Pro Gly Ile
 90 95 100

341

ttt gaa aat tcg tgt ctt gaa aca atg gag gtg gtt cag cag aca aga
 Phe Glu Asn Ser Cys Leu Glu Thr Met Glu Val Val Gln Gln Thr Arg
 105 110 115

389

gtg gac aaa cta aca caa ggc cga caa act tac gat tgg acc ttg aat
 Val Asp Lys Leu Thr Gln Gly Arg Gln Thr Tyr Asp Trp Thr Leu Asn
 120 125 130

437

agg aat caa cct gcc gca aca gca ctt gct aat aca att gaa gtg ttc
 Arg Asn Gln Pro Ala Ala Thr Ala Leu Ala Asn Thr Ile Glu Val Phe
 135 140 145 150

485

aga tca aat gat ctg act tcc agt gag tca ggg aga tta atg gac ttc

533

EQ-1-C2-1.ST25.txt

Arg Ser Asn Asp Leu Thr Ser Ser Glu Ser Gly Arg Leu Met Asp Phe	
155 160 165	
ctc aaa gat gtc atg gag tcc atg aac aag gaa gaa atg gaa ata aca	581
Leu Lys Asp Val Met Glu Ser Met Asn Lys Glu Glu Met Glu Ile Thr	
170 175 180	
aca cac ttc caa cgg aag aga aga gta aga gac aac atg aca aag aga	629
Thr His Phe Gln Arg Lys Arg Arg Val Arg Asp Asn Met Thr Lys Arg	
185 190 195	
atg gtg aca cag aga acc ata ggg aag aaa aaa caa cga tta aac aga	677
Met Val Thr Gln Arg Thr Ile Gly Lys Lys Lys Gln Arg Leu Asn Arg	
200 205 210	
aag agc tat ctg atc agg gca tta acc tta aac aca atg acc aag gac	725
Lys Ser Tyr Leu Ile Arg Ala Leu Thr Leu Asn Thr Met Thr Lys Asp	
215 220 225 230	
gct gag aga ggg aaa ttg aaa cga cga gca att gca acc cca gga atg	773
Ala Glu Arg Gly Lys Leu Lys Arg Arg Ala Ile Ala Thr Pro Gly Met	
235 240 245	
cag ata aga ggg ttt gta tat ttt gtt gaa aca tta gcc cga aga ata	821
Gln Ile Arg Gly Phe Val Tyr Phe Val Glu Thr Leu Ala Arg Arg Ile	
250 255 260	
tgt gaa aag ctt gaa caa tca gga ttg cca gtt ggc ggt aat gag aaa	869
Cys Glu Lys Leu Glu Gln Ser Gly Leu Pro Val Gly Gly Asn Glu Lys	
265 270 275	
aag gcc aaa ctg gct aat gtc gtc aga aaa atg atg act aat tcc caa	917
Lys Ala Lys Leu Ala Asn Val Val Arg Lys Met Met Thr Asn Ser Gln	
280 285 290	
gac act gaa ctc tcc ttc acc atc act ggg gac aat acc aaa tgg aat	965
Asp Thr Glu Leu Ser Phe Thr Ile Thr Gly Asp Asn Thr Lys Trp Asn	
295 300 305 310	
gaa aat cag aac cca cgc atg ttc ctg gca atg atc aca tac ata act	1013
Glu Asn Gln Asn Pro Arg Met Phe Leu Ala Met Ile Thr Tyr Ile Thr	
315 320 325	
aga aac cag cca gaa tgg ttc aga aat gtt cta agc att gca ccg att	1061
Arg Asn Gln Pro Glu Trp Phe Arg Asn Val Leu Ser Ile Ala Pro Ile	
330 335 340	
atg ttc tca aat aaa atg gca aga ctg ggg aaa gga tat atg ttt gaa	1109
Met Phe Ser Asn Lys Met Ala Arg Leu Gly Lys Gly Tyr Met Phe Glu	
345 350 355	
agc aaa agt atg aaa ttg aga act caa ata cca gca gaa atg ctc gca	1157
Ser Lys Ser Met Lys Leu Arg Thr Gln Ile Pro Ala Glu Met Leu Ala	
360 365 370	
agc att gat ctg aaa tat ttc aat gat tca aca aaa aag aaa att gag	1205
Ser Ile Asp Leu Lys Tyr Phe Asn Asp Ser Thr Lys Lys Lys Ile Glu	
375 380 385 390	

aag ata cga cca caa gcc gaa ttc
 Lys Ile Arg Pro Gln Ala Glu Phe
 395

<210> 63
 <211> 398
 <212> PRT
 <213> Equine influenza virus H3N8
 <400> 63

Met Asp Val Asn Pro Thr Leu Leu Phe Leu Lys Val Pro Ala Gln Asn
 1 5 10 15

Ala Ile Ser Thr Thr Phe Pro Tyr Thr Gly Asp Pro Pro Tyr Ser His
 20 25 30

Gly Thr Gly Thr Gly Tyr Thr Met Asp Thr Val Asn Arg Thr His Gln
 35 40 45

Tyr Ser Glu Lys Gly Lys Trp Thr Thr Asn Thr Glu Ile Gly Ala Pro
 50 55 60

Gln Leu Asn Pro Ile Asp Gly Pro Leu Pro Glu Asp Asn Glu Pro Ser
 65 70 75 80

Gly Tyr Ala Gln Thr Asp Cys Val Leu Glu Ala Met Ala Phe Leu Glu
 85 90 95

Glu Ser His Pro Gly Ile Phe Glu Asn Ser Cys Leu Glu Thr Met Glu
 100 105 110

Val Val Gln Gln Thr Arg Val Asp Lys Leu Thr Gln Gly Arg Gln Thr
 115 120 125

Tyr Asp Trp Thr Leu Asn Arg Asn Gln Pro Ala Ala Thr Ala Leu Ala
 130 135 140

Asn Thr Ile Glu Val Phe Arg Ser Asn Asp Leu Thr Ser Ser Glu Ser
 145 150 155 160

Gly Arg Leu Met Asp Phe Leu Lys Asp Val Met Glu Ser Met Asn Lys
 165 170 175

Glu Glu Met Glu Ile Thr Thr His Phe Gln Arg Lys Arg Arg Val Arg
 180 185 190

EQ-1-C2-1.ST25.txt

Asp Asn Met Thr Lys Arg Met Val Thr Gln Arg Thr Ile Gly Lys Lys
 195 200 205

Lys Gln Arg Leu Asn Arg Lys Ser Tyr Leu Ile Arg Ala Leu Thr Leu
 210 215 220

Asn Thr Met Thr Lys Asp Ala Glu Arg Gly Lys Leu Lys Arg Arg Ala
 225 230 235 240

Ile Ala Thr Pro Gly Met Gln Ile Arg Gly Phe Val Tyr Phe Val Glu
 245 250 255

Thr Leu Ala Arg Arg Ile Cys Glu Lys Leu Glu Gln Ser Gly Leu Pro
 260 265 270

Val Gly Gly Asn Glu Lys Lys Ala Lys Leu Ala Asn Val Val Arg Lys
 275 280 285

Met Met Thr Asn Ser Gln Asp Thr Glu Leu Ser Phe Thr Ile Thr Gly
 290 295 300

Asp Asn Thr Lys Trp Asn Glu Asn Gln Asn Pro Arg Met Phe Leu Ala
 305 310 315 320

Met Ile Thr Tyr Ile Thr Arg Asn Gln Pro Glu Trp Phe Arg Asn Val
 325 330 335

Leu Ser Ile Ala Pro Ile Met Phe Ser Asn Lys Met Ala Arg Leu Gly
 340 345 350

Lys Gly Tyr Met Phe Glu Ser Lys Ser Met Lys Leu Arg Thr Gln Ile
 355 360 365

Pro Ala Glu Met Leu Ala Ser Ile Asp Leu Lys Tyr Phe Asn Asp Ser
 370 375 380

Thr Lys Lys Lys Ile Glu Lys Ile Arg Pro Gln Ala Glu Phe
 385 390 395

<210> 64
 <211> 1194
 <212> DNA
 <213> Equine influenza virus H3N8

<400> 64

EQ-1-C2-1.ST25.txt

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acattccctt atactggaga tcctccctac agtcatggaa cagggacagg atacaccatg      120
gatactgtca acagaacaca tcaatactca gaaaagggga aatggacaac aaacactgag      180
attggagcac cacaacttaa tccaatcgat ggaccgcttc ctgaagacaa tgaaccaagt      240
gggtacgccc aaacagattg tgtattggaa gcaatggctt tccttgaaga atcccatccc      300
ggaatctttg aaaattcgtg tcttgaaaca atggaggtgg ttcagcagac aagagtggac      360
aaactaacac aaggccgaca aacttacgat tggaccttga ataggaatca acctgccgca      420
acagcacttg ctaatacaat tgaagtgttc agatcaaagc atctgacttc cagtgaagtca      480
gggagattaa tggacttcct caaagatgtc atggagtcca tgaacaagga agaaatggaa      540
ataacaacac acttccaacg gaagagaaga gtaagagaca acatgacaaa gagaatgggtg      600
acacagagaa ccatagggaa gaaaaaaca cgattaaaca gaaagagcta tctgatcagg      660
gcattaacct taaacacaat gaccaaggac gctgagagag ggaaattgaa acgacgagca      720
attgcaacct caggaatgca gataagaggg tttgtatatt ttgttgaaac attagcccga      780
agaatatgtg aaaagcttga acaatcagga ttgccagttg gcggtaatga gaaaaaggcc      840
aaactggcta atgtcgtcag aaaaatgatg actaattccc aagacactga actctccttc      900
accatcactg gggacaatac caaatggaat gaaaatcaga acccacgcat gttcctggca      960
atgatcacat acataactag aaaccagcca gaatgggttca gaaatgttct aagcattgca     1020
ccgattatgt tctcaaataa aatggcaaga ctggggaaag gatatatgtt tgaaagcaaa     1080
agtatgaaat tgagaactca aataccagca gaaatgctcg caagcattga tctgaaatat     1140
ttcaatgatt caacaaaaaa gaaaattgag aagatacgac cacaagccga attc           1194

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<210> 65
<211> 673
<212> DNA
<213> Equine influenza virus H3N8

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<220>
<221> CDS
<222> (36)..(671)
<223>

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<400> 65
gaattcggct tagcaaaaagc aggcaaacta tttga atg gat gtc aat ccg act      53
                               Met Asp Val Asn Pro Thr
                               1                     5

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cta ctc ttc tta aag gtg cca gcg caa aat gct ata agc aca aca ttc      101
Leu Leu Phe Leu Lys Val Pro Ala Gln Asn Ala Ile Ser Thr Thr Phe

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10	15	20	
cct tat act gga gat cct ccc tac agt cat gga aca ggg aca gga tac Pro Tyr Thr Gly Asp Pro Pro Tyr Ser His Gly Thr Gly Thr Gly Tyr 25 30 35			149
acc atg gat act gtc aac aga aca cat caa tac tca gaa aag ggg aaa Thr Met Asp Thr Val Asn Arg Thr His Gln Tyr Ser Glu Lys Gly Lys 40 45 50			197
tgg aca aca aac act gag att gga gca cca caa ctt aat cca atc gat Trp Thr Thr Asn Thr Glu Ile Gly Ala Pro Gln Leu Asn Pro Ile Asp 55 60 65 70			245
gga ccg ctt cct gaa gac aat gaa cca agt ggg tac gcc caa aca gat Gly Pro Leu Pro Glu Asp Asn Glu Pro Ser Gly Tyr Ala Gln Thr Asp 75 80 85			293
tgt gta ttg gaa gca atg gct ttc ctt gaa gaa tcc cat ccc gga atc Cys Val Leu Glu Ala Met Ala Phe Leu Glu Glu Ser His Pro Gly Ile 90 95 100			341
ttt gaa aat tcg tgt ctt gaa aca atg gag gtg gtt cag cag aca aga Phe Glu Asn Ser Cys Leu Glu Thr Met Glu Val Val Gln Gln Thr Arg 105 110 115			389
gtg gac aaa cta aca caa ggc cga caa act tac gat tgg acc ttg aat Val Asp Lys Leu Thr Gln Gly Arg Gln Thr Tyr Asp Trp Thr Leu Asn 120 125 130			437
agg aat caa cct gcc gca aca gca ctt gct aat aca att gaa gtg ttc Arg Asn Gln Pro Ala Ala Thr Ala Leu Ala Asn Thr Ile Glu Val Phe 135 140 145 150			485
aga tca aat gat ctg act tcc agt gag tca ggg aga tta atg gac ttc Arg Ser Asn Asp Leu Thr Ser Ser Glu Ser Gly Arg Leu Met Asp Phe 155 160 165			533
ctc aaa gat gtc atg gag tcc atg aac aag gaa gaa atg gaa ata aca Leu Lys Asp Val Met Glu Ser Met Asn Lys Glu Glu Met Glu Ile Thr 170 175 180			581
aca cac ttc caa cgg aag aga aga gta aga gac aac atg aca aag aga Thr His Phe Gln Arg Lys Arg Arg Val Arg Asp Asn Met Thr Lys Arg 185 190 195			629
atg gtg aca cag aga acc ata ggg aag aaa aaa caa cga tta aa Met Val Thr Gln Arg Thr Ile Gly Lys Lys Lys Gln Arg Leu 200 205 210			673

<210> 66
 <211> 212
 <212> PRT
 <213> Equine influenza virus H3N8

 <400> 66

Met Asp Val Asn Pro Thr Leu Leu Phe Leu Lys Val Pro Ala Gln Asn

1

5

10

15

Ala Ile Ser Thr Thr Phe Pro Tyr Thr Gly Asp Pro Pro Tyr Ser His
20 25 30

Gly Thr Gly Thr Gly Tyr Thr Met Asp Thr Val Asn Arg Thr His Gln
35 40 45

Tyr Ser Glu Lys Gly Lys Trp Thr Thr Asn Thr Glu Ile Gly Ala Pro
50 55 60

Gln Leu Asn Pro Ile Asp Gly Pro Leu Pro Glu Asp Asn Glu Pro Ser
65 70 75 80

Gly Tyr Ala Gln Thr Asp Cys Val Leu Glu Ala Met Ala Phe Leu Glu
85 90 95

Glu Ser His Pro Gly Ile Phe Glu Asn Ser Cys Leu Glu Thr Met Glu
100 105 110

Val Val Gln Gln Thr Arg Val Asp Lys Leu Thr Gln Gly Arg Gln Thr
115 120 125

Tyr Asp Trp Thr Leu Asn Arg Asn Gln Pro Ala Ala Thr Ala Leu Ala
130 135 140

Asn Thr Ile Glu Val Phe Arg Ser Asn Asp Leu Thr Ser Ser Glu Ser
145 150 155 160

Gly Arg Leu Met Asp Phe Leu Lys Asp Val Met Glu Ser Met Asn Lys
165 170 175

Glu Glu Met Glu Ile Thr Thr His Phe Gln Arg Lys Arg Arg Val Arg
180 185 190

Asp Asn Met Thr Lys Arg Met Val Thr Gln Arg Thr Ile Gly Lys Lys
195 200 205

Lys Gln Arg Leu
210

<210> 67

<211> 636

<212> DNA

<213> Equine influenza virus H3N8

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gatactgtca acagaacaca tcaatactca gaaaagggga aatggacaac aaacactgag      180
attggagcac cacaacttaa tccaatcgat ggaccgcttc ctgaagacaa tgaaccaagt      240
gggtacgccc aaacagattg tgtattggaa gcaatggctt tccttgaaga atcccatccc      300
ggaatctttg aaaattcgtg tcttgaaaca atggaggtgg ttcagcagac aagagtggac      360
aaactaacac aaggccgaca aacttacgat tggaccttga ataggaatca acctgccgca      420
acagcacttg ctaatacaat tgaagtgttc agatcaaagt atctgacttc cagtgagtca      480
gggagattaa tggacttcct caaagatgtc atggagtcca tgaacaagga agaaatggaa      540
ataacaacac acttccaacg gaagagaaga gtaagagaca acatgacaaa gagaatggtg      600
acacagagaa ccatagggaa gaaaaaacia cgatta                                636

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<210> 68
<211> 1225
<212> DNA
<213> Equine influenza virus H3N8

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<220>
<221> CDS
<222> (34)..(1218)
<223>

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<400> 68
gaattcagga gcaaaagcag gcaaactatt tga atg gat gtc aat ccg act cta      54
                               Met Asp Val Asn Pro Thr Leu
                               1                               5

ctc ttc tta aag gtg cca gcg caa aat gct ata agc aca aca ttc cct      102
Leu Phe Leu Lys Val Pro Ala Gln Asn Ala Ile Ser Thr Thr Phe Pro
                               10                               15                               20

tat act gga gat cct ccc tac agt cat gga aca ggg aca gga tac acc      150
Tyr Thr Gly Asp Pro Pro Tyr Ser His Gly Thr Gly Thr Gly Tyr Thr
                               25                               30                               35

atg gat act gtc aac aga aca cat caa tac tca gaa aag ggg aaa tgg      198
Met Asp Thr Val Asn Arg Thr His Gln Tyr Ser Glu Lys Gly Lys Trp
40                               45                               50                               55

aca aca aac act gag att gga gca cca caa ctt aat cca atc gat gga      246
Thr Thr Asn Thr Glu Ile Gly Ala Pro Gln Leu Asn Pro Ile Asp Gly
                               60                               65                               70

ccg ctt cct gaa gac aat gaa cca agt ggg tac gcc caa aca gat tgt      294
Pro Leu Pro Glu Asp Asn Glu Pro Ser Gly Tyr Ala Gln Thr Asp Cys

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75	80	85	
gta ttg gaa gca atg gct ttc ctt gaa gaa tcc cat ccc gga atc ttt Val Leu Glu Ala Met Ala Phe Leu Glu Glu Ser His Pro Gly Ile Phe 90 95 100			342
gaa aat tcg tgt ctt gaa aca atg gag gtg gtt cag cag aca aga gtg Glu Asn Ser Cys Leu Glu Thr Met Glu Val Val Gln Gln Thr Arg Val 105 110 115			390
gac aaa cta aca caa ggc cga caa act tac gat tgg acc ttg aat agg Asp Lys Leu Thr Gln Gly Arg Gln Thr Tyr Asp Trp Thr Leu Asn Arg 120 125 130 135			438
aat caa cct gcc gca aca gca ctt gct aat aca att gaa gtg ttc aga Asn Gln Pro Ala Ala Thr Ala Leu Ala Asn Thr Ile Glu Val Phe Arg 140 145 150			486
tca aat gat ctg act tcc agt gag tca ggg aga tta atg gac ttc ctc Ser Asn Asp Leu Thr Ser Ser Glu Ser Gly Arg Leu Met Asp Phe Leu 155 160 165			534
aaa gat gtc atg gag tcc atg aac aag gaa gaa atg gaa ata aca aca Lys Asp Val Met Glu Ser Met Asn Lys Glu Glu Met Glu Ile Thr Thr 170 175 180			582
cac ttc caa cgg aag aga aga gta aga gac aac atg aca aag aga atg His Phe Gln Arg Lys Arg Arg Val Arg Asp Asn Met Thr Lys Arg Met 185 190 195			630
gtg aca cag aga acc ata ggg aag aaa aaa caa cga tta aac aga aag Val Thr Gln Arg Thr Ile Gly Lys Lys Lys Gln Arg Leu Asn Arg Lys 200 205 210 215			678
agc tat ctg atc agg gca tta acc tta aac aca atg acc aag gac gct Ser Tyr Leu Ile Arg Ala Leu Thr Leu Asn Thr Met Thr Lys Asp Ala 220 225 230			726
gag aga ggg aaa ttg aaa cga cga gca att gca acc cca gga atg cag Glu Arg Gly Lys Leu Lys Arg Arg Ala Ile Ala Thr Pro Gly Met Gln 235 240 245			774
ata aga ggg ttt gta tat ttt gtt gaa aca tta gcc cga aga ata tgt Ile Arg Gly Phe Val Tyr Phe Val Glu Thr Leu Ala Arg Arg Ile Cys 250 255 260			822
gaa aag ctt gaa caa tca gga ttg cca gtt ggc ggt aat gag aaa aag Glu Lys Leu Glu Gln Ser Gly Leu Pro Val Gly Gly Asn Glu Lys Lys 265 270 275			870
gcc aaa ctg gct aat gtc gtc aga aaa atg atg act aat tcc caa gac Ala Lys Leu Ala Asn Val Val Arg Lys Met Met Thr Asn Ser Gln Asp 280 285 290 295			918
act gaa ctc tcc ttc acc atc act ggg gac aat acc aaa tgg aat gaa Thr Glu Leu Ser Phe Thr Ile Thr Gly Asp Asn Thr Lys Trp Asn Glu 300 305 310			966
aat cag aac cca cgc atg ttc ctg gca atg atc aca tac ata act aga			1014

EQ-1-C2-1.ST25.txt

Asn	Gln	Asn	Pro	Arg	Met	Phe	Leu	Ala	Met	Ile	Thr	Tyr	Ile	Thr	Arg		
			315					320					325				
aac	cag	cca	gaa	tgg	ttc	aga	aat	gtt	cta	agc	att	gca	cgc	att	atg	1062	
Asn	Gln	Pro	Glu	Trp	Phe	Arg	Asn	Val	Leu	Ser	Ile	Ala	Pro	Ile	Met		
		330					335					340					
ttc	tca	aat	aaa	atg	gca	aga	ctg	ggg	aaa	gga	tat	atg	ttt	gaa	agc	1110	
Phe	Ser	Asn	Lys	Met	Ala	Arg	Leu	Gly	Lys	Gly	Tyr	Met	Phe	Glu	Ser		
		345				350					355						
aaa	agt	atg	aaa	ttg	aga	act	caa	ata	cca	gca	gaa	atg	ctc	gca	agc	1158	
Lys	Ser	Met	Lys	Leu	Arg	Thr	Gln	Ile	Pro	Ala	Glu	Met	Leu	Ala	Ser		
360					365					370					375		
att	gat	ctg	aaa	tat	ttc	aat	gat	tca	aca	aaa	aag	aaa	att	gag	aag	1206	
Ile	Asp	Leu	Lys	Tyr	Phe	Asn	Asp	Ser	Thr	Lys	Lys	Lys	Ile	Glu	Lys		
				380					385					390			
ata	cga	cca	ccc	tgaattc												1225	
Ile	Arg	Pro	Pro														
			395														
<210> 69																	
<211> 395																	
<212> PRT																	
<213> Equine influenza virus H3N8																	
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Met	Asp	Val	Asn	Pro	Thr	Leu	Leu	Phe	Leu	Lys	Val	Pro	Ala	Gln	Asn		
1				5					10					15			
Ala	Ile	Ser	Thr	Thr	Phe	Pro	Tyr	Thr	Gly	Asp	Pro	Pro	Tyr	Ser	His		
			20					25					30				
Gly	Thr	Gly	Thr	Gly	Tyr	Thr	Met	Asp	Thr	Val	Asn	Arg	Thr	His	Gln		
		35					40					45					
Tyr	Ser	Glu	Lys	Gly	Lys	Trp	Thr	Thr	Asn	Thr	Glu	Ile	Gly	Ala	Pro		
		50				55					60						
Gln	Leu	Asn	Pro	Ile	Asp	Gly	Pro	Leu	Pro	Glu	Asp	Asn	Glu	Pro	Ser		
65					70					75					80		
Gly	Tyr	Ala	Gln	Thr	Asp	Cys	Val	Leu	Glu	Ala	Met	Ala	Phe	Leu	Glu		
				85					90					95			
Glu	Ser	His	Pro	Gly	Ile	Phe	Glu	Asn	Ser	Cys	Leu	Glu	Thr	Met	Glu		
			100					105						110			

EQ-1-C2-1.ST25.txt

Val Val Gln Gln Thr Arg Val Asp Lys Leu Thr Gln Gly Arg Gln Thr
 115 120 125

Tyr Asp Trp Thr Leu Asn Arg Asn Gln Pro Ala Ala Thr Ala Leu Ala
 130 135 140

Asn Thr Ile Glu Val Phe Arg Ser Asn Asp Leu Thr Ser Ser Glu Ser
 145 150 155 160

Gly Arg Leu Met Asp Phe Leu Lys Asp Val Met Glu Ser Met Asn Lys
 165 170 175

Glu Glu Met Glu Ile Thr Thr His Phe Gln Arg Lys Arg Arg Val Arg
 180 185 190

Asp Asn Met Thr Lys Arg Met Val Thr Gln Arg Thr Ile Gly Lys Lys
 195 200 205

Lys Gln Arg Leu Asn Arg Lys Ser Tyr Leu Ile Arg Ala Leu Thr Leu
 210 215 220

Asn Thr Met Thr Lys Asp Ala Glu Arg Gly Lys Leu Lys Arg Arg Ala
 225 230 235 240

Ile Ala Thr Pro Gly Met Gln Ile Arg Gly Phe Val Tyr Phe Val Glu
 245 250 255

Thr Leu Ala Arg Arg Ile Cys Glu Lys Leu Glu Gln Ser Gly Leu Pro
 260 265 270

Val Gly Gly Asn Glu Lys Lys Ala Lys Leu Ala Asn Val Val Arg Lys
 275 280 285

Met Met Thr Asn Ser Gln Asp Thr Glu Leu Ser Phe Thr Ile Thr Gly
 290 295 300

Asp Asn Thr Lys Trp Asn Glu Asn Gln Asn Pro Arg Met Phe Leu Ala
 305 310 315 320

Met Ile Thr Tyr Ile Thr Arg Asn Gln Pro Glu Trp Phe Arg Asn Val
 325 330 335

Leu Ser Ile Ala Pro Ile Met Phe Ser Asn Lys Met Ala Arg Leu Gly
 340 345 350

Lys Gly Tyr Met Phe Glu Ser Lys Ser Met Lys Leu Arg Thr Gln Ile
 355 360 365

Pro Ala Glu Met Leu Ala Ser Ile Asp Leu Lys Tyr Phe Asn Asp Ser
 370 375 380

Thr Lys Lys Lys Ile Glu Lys Ile Arg Pro Pro
 385 390 395

<210> 70
 <211> 1185
 <212> DNA
 <213> Equine influenza virus H3N8

<400> 70
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 gatactgtca acagaacaca tcaatactca gaaaagggga aatggacaac aaacactgag 180
 attggagcac cacaacttaa tccaatcgat ggaccgcttc ctgaagacaa tgaaccaagt 240
 gggtagcccc aaacagattg tgtattggaa gcaatggctt tccttgaaga atcccatccc 300
 ggaatctttg aaaattcgtg tcttgaaaca atggaggtgg ttcagcagac aagagtggac 360
 aaactaacac aaggccgaca aacttacgat tggaccttga ataggaatca acctgccgca 420
 acagcacttg ctaatacaat tgaagtgttc agatcaaagc atctgacttc cagtgaagtca 480
 gggagattaa tggacttcct caaagatgtc atggagtcca tgaacaagga agaaatggaa 540
 ataacaacac acttccaacg gaagagaaga gtaagagaca acatgacaaa gagaatgggtg 600
 acacagagaa ccatagggaa gaaaaaaca cgattaaaca gaaagagcta tctgatcagg 660
 gcattaacct taaacacaat gaccaaggac gctgagagag ggaaattgaa acgacgagca 720
 attgcaaccc caggaatgca gataagaggg tttgtatatt ttgttgaaac attagcccga 780
 agaatatgtg aaaagcttga acaatcagga ttgccagttg gcggtaatga gaaaaaggcc 840
 aaactggcta atgtcgtcag aaaaatgatg actaattccc aagacactga actctccttc 900
 accatcactg gggacaatac caaatggaat gaaaatcaga acccacgcat gttcctggca 960
 atgatcacat acataactag aaaccagcca gaatgggttca gaaatgttct aagcattgca 1020
 ccgattatgt tctcaaataa aatggcaaga ctggggaaag gatatatgtt tgaaagcaaa 1080
 agtatgaaat tgagaactca aataccagca gaaatgctcg caagcattga tctgaaatat 1140
 ttcaatgatt caacaaaaaa gaaaattgag aagatacgac cacc 1185

<210> 71
 <211> 1221
 <212> DNA
 <213> Equine influenza virus H3N8

<400> 71
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 gtcattggaac agggacagga tacaccatgg atactgtcaa cagaacacat caatactcag 180
 aaaaggggaa atggacaaca aacactgaga ttggagcacc acaacttaat ccaatcgatg 240
 gaccgcttcc tgaagacaat gaaccaagtg ggtacgcca aacagattgt gtattggaag 300
 caatggcttt ccttgaagaa tcccatcccg gaatctttga aaattcgtgt cttgaaacaa 360
 tggaggtggt tcagcagaca agagtggaca aactaacaca aggccgacaa acttacgatt 420
 ggaccttgaa taggaatcaa cctgccgcaa cagcacttgc taatacaatt gaagtgttca 480
 gatcaaatga tctgacttcc agtgagtcag ggagattaat ggacttcctc aaagatgtca 540
 tggagtccat gaacaaggaa gaaatggaaa taacaacaca cttccaacgg aagagaagag 600
 taagagacaa catgacaaag agaatggtga cacagagaac catagggaag aaaaaacaac 660
 gattaaacag aaagagctat ctgatcaggg cattaacctt aaacacaatg accaaggacg 720
 ctgagagagg gaaattgaaa cgacgagcaa ttgcaacccc aggaatgcag ataagagggt 780
 ttgtatatatt tgttgaaaca ttagcccgaa gaatatgtga aaagcttgaa caatcaggat 840
 tgccagttgg cggtaatgag aaaaaggcca aactggctaa tgtcgtcaga aaaatgatga 900
 ctaattccca agacactgaa ctctccttca ccatcactgg ggacaatacc aaatggaatg 960
 aaaatcagaa ccacgcgatg ttcttggaac tgatcacata cataactaga aaccagccag 1020
 aatggttcag aaatgttcta agcattgcac cgattatggt ctcaaataaa atggcaagac 1080
 tggggaaagg atatatgttt gaaagcaaaa gtatgaaatt gagaactcaa ataccagcag 1140
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<210> 72
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 <213> Artificial sequence

<220>
 <223> Synthetic Primer

<400> 72

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18

<210> 73
 <211> 18
 <212> DNA
 <213> Artificial sequence

<220>
 <223> Synthetic Primer

<400> 73
 gactgaggac tcagcttc

18

<210> 74
 <211> 19
 <212> DNA
 <213> Artificial sequence

<220>
 <223> Synthetic Primer

<400> 74
 caatatactc cccaatttc

19

<210> 75
 <211> 19
 <212> DNA
 <213> Artificial sequence

<220>
 <223> Synthetic Primer

<400> 75
 ggaagggttg caggacctt

19

<210> 76
 <211> 1228
 <212> DNA
 <213> Equine influenza virus H3N8

<220>
 <221> CDS
 <222> (3)..(1166)
 <223>

<400> 76
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 1 5 10 15

47

gaa cta caa gac ctt gag aac gaa gaa aag acc cct aag acc aag aat
 Glu Leu Gln Asp Leu Glu Asn Glu Glu Lys Thr Pro Lys Thr Lys Asn
 20 25 30

95

EQ-1-C2-1.ST25.txt

atg aaa aaa aca agc caa ttg aaa tgg gca ctc ggt gaa aat atg gca Met Lys Lys Thr Ser Gln Leu Lys Trp Ala Leu Gly Glu Asn Met Ala 35 40 45	143
cca gag aaa gtg gat ttt gag gat tgt aaa gac atc aat gat ttg aaa Pro Glu Lys Val Asp Phe Glu Asp Cys Lys Asp Ile Asn Asp Leu Lys 50 55 60	191
cag tat gac agt gat gag cca gaa aca agg tct ctt gca agt tgg att Gln Tyr Asp Ser Asp Glu Pro Glu Thr Arg Ser Leu Ala Ser Trp Ile 65 70 75	239
caa agt gag ttc aac aaa gct tgt gag ctg aca gat tca agc tgg ata Gln Ser Glu Phe Asn Lys Ala Cys Glu Leu Thr Asp Ser Ser Trp Ile 80 85 90 95	287
gag ctc gat gaa att ggg gag gat att gcc cca ata gaa tac att gcg Glu Leu Asp Glu Ile Gly Glu Asp Ile Ala Pro Ile Glu Tyr Ile Ala 100 105 110	335
agc atg agg aga aat tat ttt act gct gag gtt tcc cat tgt aga gca Ser Met Arg Arg Asn Tyr Phe Thr Ala Glu Val Ser His Cys Arg Ala 115 120 125	383
aca gaa tat ata atg aag gga gtg tac atc aac act gct cta ctc aat Thr Glu Tyr Ile Met Lys Gly Val Tyr Ile Asn Thr Ala Leu Leu Asn 130 135 140	431
gca tcc tgt gct gcg atg gat gaa ttc caa tta att ccg atg ata agc Ala Ser Cys Ala Ala Met Asp Glu Phe Gln Leu Ile Pro Met Ile Ser 145 150 155	479
aaa tgc agg acc aaa gaa ggg aga agg aag aca aat tta tat gga ttc Lys Cys Arg Thr Lys Glu Gly Arg Arg Lys Thr Asn Leu Tyr Gly Phe 160 165 170 175	527
ata ata aag gga agg tcc cat tta agg aat gat acc gac gtg gta aac Ile Ile Lys Gly Arg Ser His Leu Arg Asn Asp Thr Asp Val Val Asn 180 185 190	575
ttt gta agt atg gaa ttt tct ctc act gat cca aga ttt gag cca cat Phe Val Ser Met Glu Phe Ser Leu Thr Asp Pro Arg Phe Glu Pro His 195 200 205	623
aaa tgg gaa aaa tac tgc gtt cta gaa att gga gac atg ctc cta agg Lys Trp Glu Lys Tyr Cys Val Leu Glu Ile Gly Asp Met Leu Leu Arg 210 215 220	671
act gct gta ggt caa gtg tca aga ccc atg ttt ttg tat gta agg aca Thr Ala Val Gly Gln Val Ser Arg Pro Met Phe Leu Tyr Val Arg Thr 225 230 235	719
aat gga acc tct aaa att aaa atg aaa cgg gga atg gaa atg aga cgc Asn Gly Thr Ser Lys Ile Lys Met Lys Arg Gly Met Glu Met Arg Arg 240 245 250 255	767
tgc ctc ctt cag tct ctg caa cag att gaa agc atg atc gaa gct gag Cys Leu Leu Gln Ser Leu Gln Gln Ile Glu Ser Met Ile Glu Ala Glu 260 265 270	815

EQ-1-C2-1.ST25.txt

tcc tca gtc aaa gaa aag gac atg acc aaa gaa ttc ttt gag aac aaa	863
Ser Ser Val Lys Glu Lys Asp Met Thr Lys Glu Phe Phe Glu Asn Lys	
275 280 285	
tca gag aca tgg cct ata gga gag tcc ccc aaa gga gtg gaa gag ggc	911
Ser Glu Thr Trp Pro Ile Gly Glu Ser Pro Lys Gly Val Glu Glu Gly	
290 295 300	
tca atc ggg aag gtt tgc agg acc tta tta gca aaa tct gtg ttt aac	959
Ser Ile Gly Lys Val Cys Arg Thr Leu Leu Ala Lys Ser Val Phe Asn	
305 310 315	
agt ttg tat gca tct cca caa ctg gaa ggg ttt tca gct gaa tct agg	1007
Ser Leu Tyr Ala Ser Pro Gln Leu Glu Gly Phe Ser Ala Glu Ser Arg	
320 325 330 335	
aaa tta ctt ctc att gtt cag gcc ctt agg gat aac ctg gaa cct gga	1055
Lys Leu Leu Leu Ile Val Gln Ala Leu Arg Asp Asn Leu Glu Pro Gly	
340 345 350	
acc ttt gat att ggg ggg tta tat gaa tca att gag gag tgc ctg att	1103
Thr, Phe Asp Ile Gly Gly Leu Tyr Glu Ser Ile Glu Glu Cys Leu Ile	
355 360 365	
aat gat ccc tgg gtt ttg ctc aat gca tct tgg ttc aac tcc ttc ctt	1151
Asn Asp Pro Trp Val Leu Leu Asn Ala Ser Trp Phe Asn Ser Phe Leu	
370 375 380	
aca cat gca ctg aag tagttgtagc aatgctacta tttgctatcc atactgtcca	1206
Thr His Ala Leu Lys	
385	
aaaaagtact cgagccccca ag	1228
<210> 77	
<211> 388	
<212> PRT	
<213> Equine influenza virus H3N8	
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Leu Gln Asp Leu Glu Asn Glu Glu Lys Thr Pro Lys Thr Lys Asn Met	
20 25 30	
Lys Lys Thr Ser Gln Leu Lys Trp Ala Leu Gly Glu Asn Met Ala Pro	
35 40 45	
Glu Lys Val Asp Phe Glu Asp Cys Lys Asp Ile Asn Asp Leu Lys Gln	
50 55 60	

EQ-1-C2-1.ST25.txt

Tyr Asp Ser Asp Glu Pro Glu Thr Arg Ser Leu Ala Ser Trp Ile Gln
 65 70 75 80

Ser Glu Phe Asn Lys Ala Cys Glu Leu Thr Asp Ser Ser Trp Ile Glu
 85 90 95

Leu Asp Glu Ile Gly Glu Asp Ile Ala Pro Ile Glu Tyr Ile Ala Ser
 100 105 110

Met Arg Arg Asn Tyr Phe Thr Ala Glu Val Ser His Cys Arg Ala Thr
 115 120 125

Glu Tyr Ile Met Lys Gly Val Tyr Ile Asn Thr Ala Leu Leu Asn Ala
 130 135 140

Ser Cys Ala Ala Met Asp Glu Phe Gln Leu Ile Pro Met Ile Ser Lys
 145 150 155 160

Cys Arg Thr Lys Glu Gly Arg Arg Lys Thr Asn Leu Tyr Gly Phe Ile
 165 170 175

Ile Lys Gly Arg Ser His Leu Arg Asn Asp Thr Asp Val Val Asn Phe
 180 185 190

Val Ser Met Glu Phe Ser Leu Thr Asp Pro Arg Phe Glu Pro His Lys
 195 200 205

Trp Glu Lys Tyr Cys Val Leu Glu Ile Gly Asp Met Leu Leu Arg Thr
 210 215 220

Ala Val Gly Gln Val Ser Arg Pro Met Phe Leu Tyr Val Arg Thr Asn
 225 230 235 240

Gly Thr Ser Lys Ile Lys Met Lys Arg Gly Met Glu Met Arg Arg Cys
 245 250 255

Leu Leu Gln Ser Leu Gln Gln Ile Glu Ser Met Ile Glu Ala Glu Ser
 260 265 270

Ser Val Lys Glu Lys Asp Met Thr Lys Glu Phe Phe Glu Asn Lys Ser
 275 280 285

Glu Thr Trp Pro Ile Gly Glu Ser Pro Lys Gly Val Glu Glu Gly Ser
 290 295 300

EQ-1-C2-1.ST25.txt

Ile Gly Lys Val Cys Arg Thr Leu Leu Ala Lys Ser Val Phe Asn Ser
305 310 315 320

Leu Tyr Ala Ser Pro Gln Leu Glu Gly Phe Ser Ala Glu Ser Arg Lys
325 330 335

Leu Leu Leu Ile Val Gln Ala Leu Arg Asp Asn Leu Glu Pro Gly Thr
340 345 350

Phe Asp Ile Gly Gly Leu Tyr Glu Ser Ile Glu Glu Cys Leu Ile Asn
355 360 365

Asp Pro Trp Val Leu Leu Asn Ala Ser Trp Phe Asn Ser Phe Leu Thr
370 375 380

His Ala Leu Lys
385

<210> 78
<211> 1164
<212> DNA
<213> Equine influenza virus H3N8

<400> 78
ggcgggtacc caaactatct ccaagcttgg aagcaagtat tagcagaact acaagacctt 60
gagaacgaag aaaagacccc taagaccaag aatatgaaaa aaacaagcca attgaaatgg 120
gcactcgggtg aaaatatggc accagagaaa gtggattttg aggattgtaa agacatcaat 180
gatttgaaac agtatgacag tgatgagcca gaaacaaggt ctcttgcaag ttggattcaa 240
agtgaattca acaaagcttg tgagctgaca gattcaagct ggatagagct cgatgaaatt 300
ggggaggata ttgcccacat agaatacatt gcgagcatga ggagaaatta ttttactgct 360
gagggtttccc attgtagagc aacagaatat ataatgaagg gagtgtacat caaactgct 420
ctactcaatg catcctgtgc tgcgatggat gaattccaat taattccgat gataagcaaa 480
tgcaggacca aagaaggagg aaggaagaca aatttatatg gattcataat aaagggaagg 540
tcccatttaa ggaatgatac cgacgtggta aactttgtaa gtatggaatt ttctctcact 600
gatccaagat ttgagccaca taaatgggaa aaatactgcg ttctagaaat tggagacatg 660
ctcctaagga ctgctgtagg tcaagtgtca agacccatgt ttttgtatgt aaggacaaat 720
ggaacctcta aaattaaaat gaaacgggga atggaaatga gacgctgcct ccttcagtct 780
ctgcaacaga ttgaaagcat gatcgaagct gagtccctcag tcaaagaaaa ggacatgacc 840

EQ-1-C2-1.ST25.txt

aaagaattct ttgagaacaa atcagagaca tggcctatag gagagtcccc caaaggagtg 900
gaagagggct caatcgggaa ggtttgcagg accttattag caaaatctgt gtttaacagt 960
ttgtatgcat ctccacaact ggaagggttt tcagctgaat ctaggaaatt acttctcatt 1020
gttcaggccc ttagggataa cctggaacct ggaacctttg atattggggg gttatatgaa 1080
tcaattgagg agtgcctgat taatgatccc tgggttttgc tcaatgcatc ttggttcaac 1140
tccttcctta cacatgcact gaag 1164

<210> 79
<211> 1223
<212> DNA
<213> Equine influenza virus H3N8

<400> 79
ggggcgggta cccaaactat ctccaagctt ggaagcaagt attagcagaa ctacaagacc 60
ttgagaacga agaaaagacc cctaagacca agaatatgaa aaaaacaagc caattgaaat 120
gggcactcgg tgaaaatatg gcaccagaga aagtggattt tgaggattgt aaagacatca 180
atgatttgaa acagtatgac agtgatgagc cagaaacaag gtctcttgca agttggattc 240
aaagtgagtt caacaaagct tgtgagctga cagattcaag ctggatagag ctcgatgaaa 300
ttggggagga tattgcccc aatagaataga ttgcgagcat gaggagaaat tattttactg 360
ctgaggtttc ccattgtaga gcaacagaat atataatgaa gggagtgtac atcaacactg 420
ctctactcaa tgcctcctgt gctgcgatgg atgaattcca attaattccg atgataagca 480
aatgcaggac caaagaaggg agaaggaaga caaatattata tggattcata ataaagggaa 540
gggtccattt aaggaatgat accgacgtgg taaactttgt aagtatggaa ttttctctca 600
ctgatccaag atttgagcca cataaatggg aaaaatactg cgttctagaa attggagaca 660
tgctcctaag gactgctgta ggtcaagtgt caagacccat gtttttgtat gtaaggacaa 720
atggaacctc taaaattaaa atgaaatggg gaatggaaat gagacgctgc ctcttcagt 780
ctctgcaaca gattgaaagc atgatcgaag ctgagtcctc agtcaaagaa aaggacatga 840
ccaaagaatt ctttgagaac aaatcagaga catggcctat aggagagtcc cccaaaggag 900
tggaagaggg ctcaatcggg aaggtttgca ggaccttatt agcaaaatct gtgtttaaca 960
gtttgtatgc atctccacaa ctggaagggt tttcagctga atctaggaaa ttacttctca 1020
ttgttcaggc ccttagggat aacctggaac ctggaacctt tgatattggg gggttatatg 1080
aatcaattga ggagtgcctg attaatgatc cctgggtttt gctcaatgca tcttggttca 1140
actccttctt tacacatgca ctgaagtagt tgtagcaatg ctactatttg ctatccatac 1200

tgtccaaaaa agtactcgag ccc

1223

<210> 80
 <211> 1233
 <212> DNA
 <213> Equine influenza virus H3N8

<220>
 <221> CDS
 <222> (3)..(1172)
 <223>

<400> 80
 at gaa aag ggt ata aac cca aac tat ctc caa gct tgg aag caa gta 47
 Glu Lys Gly Ile Asn Pro Asn Tyr Leu Gln Ala Trp Lys Gln Val
 1 5 10 15

tta gca gaa cta caa gac ctt gag aac gaa gaa aag acc cct aag acc 95
 Leu Ala Glu Leu Gln Asp Leu Glu Asn Glu Lys Thr Pro Lys Thr
 20 25 30

aag aat atg aaa aaa aca agc caa ttg aaa tgg gca ctc ggt gaa aat 143
 Lys Asn Met Lys Lys Thr Ser Gln Leu Lys Trp Ala Leu Gly Glu Asn
 35 40 45

atg gca cca gag aaa gtg gat ttt gag gat tgt aaa gac atc aat gat 191
 Met Ala Pro Glu Lys Val Asp Phe Glu Asp Cys Lys Asp Ile Asn Asp
 50 55 60

ttg aaa cag tat gac agt gat gag cca gaa aca agg tct ctt gca agt 239
 Leu Lys Gln Tyr Asp Ser Asp Glu Pro Glu Thr Arg Ser Leu Ala Ser
 65 70 75

tgg att caa agt gag ttc aac aaa gct tgt gag ctg aca gat tca agc 287
 Trp Ile Gln Ser Glu Phe Asn Lys Ala Cys Glu Leu Thr Asp Ser Ser
 80 85 90 95

tgg ata gag ctc gat gaa att ggg gag gat att gcc cca ata gaa tac 335
 Trp Ile Glu Leu Asp Glu Ile Gly Glu Asp Ile Ala Pro Ile Glu Tyr
 100 105 110

att gcg agc atg agg aga aat tat ttt act gct gag gtt tcc cat tgt 383
 Ile Ala Ser Met Arg Arg Asn Tyr Phe Thr Ala Glu Val Ser His Cys
 115 120 125

aga gca aca gaa tat ata atg aag gga gtg tac atc aac act gct cta 431
 Arg Ala Thr Glu Tyr Ile Met Lys Gly Val Tyr Ile Asn Thr Ala Leu
 130 135 140

ctc aat gca tcc tgt gct gcg atg gat gaa ttc caa tta att ccg atg 479
 Leu Asn Ala Ser Cys Ala Ala Met Asp Glu Phe Gln Leu Ile Pro Met
 145 150 155

ata agc aaa tgc agg acc aaa gaa ggg aga agg aag aca aat tta tat 527
 Ile Ser Lys Cys Arg Thr Lys Glu Gly Arg Arg Lys Thr Asn Leu Tyr
 160 165 170 175

EQ-1-C2-1.ST25.txt

gga ttc ata ata aag gga agg tcc cat tta agg aat gat acc gac gtg Gly Phe Ile Ile Lys Gly Arg Ser His Leu Arg Asn Asp Thr Asp Val 180 185 190	575
gta aac ttt gta agt atg gaa ttt tct ctc act gat cca aga ttt gag Val Asn Phe Val Ser Met Glu Phe Ser Leu Thr Asp Pro Arg Phe Glu 195 200 205	623
cca cat aaa tgg gaa aaa tac tgc gtt cta gaa att gga gac atg ctc Pro His Lys Trp Glu Lys Tyr Cys Val Leu Glu Ile Gly Asp Met Leu 210 215 220	671
cta agg act gct gta ggt caa gtg tca aga ccc atg ttt ttg tat gta Leu Arg Thr Ala Val Gly Gln Val Ser Arg Pro Met Phe Leu Tyr Val 225 230 235	719
agg aca aat gga acc tct aaa att aaa atg aaa tgg gga atg gaa atg Arg Thr Asn Gly Thr Ser Lys Ile Lys Met Lys Trp Gly Met Glu Met 240 245 250 255	767
aga cgc tgc ctc ctt cag tct ctg caa cag att gaa agc atg atc gaa Arg Arg Cys Leu Leu Gln Ser Leu Gln Gln Ile Glu Ser Met Ile Glu 260 265 270	815
gct gag tcc tca gtc aaa gaa aag gac atg acc aaa gaa ttc ttt gag Ala Glu Ser Ser Val Lys Glu Lys Asp Met Thr Lys Glu Phe Phe Glu 275 280 285	863
aac aaa tca gag aca tgg cct ata gga gag tcc ccc aaa gga gtg gaa Asn Lys Ser Glu Thr Trp Pro Ile Gly Glu Ser Pro Lys Gly Val Glu 290 295 300	911
gag ggc tca atc ggg aag gtt tgc agg acc tta tta gca aaa tct gtg Glu Gly Ser Ile Gly Lys Val Cys Arg Thr Leu Leu Ala Lys Ser Val 305 310 315	959
ttt aac agt ttg tat gca tct cca caa ctg gaa ggg ttt tca gct gaa Phe Asn Ser Leu Tyr Ala Ser Pro Gln Leu Glu Gly Phe Ser Ala Glu 320 325 330 335	1007
tct agg aaa tta ctt ctc att gtt cag gcc ctt agg gat aac ctg gaa Ser Arg Lys Leu Leu Leu Ile Val Gln Ala Leu Arg Asp Asn Leu Glu 340 345 350	1055
cct gga acc ttt gat att ggg ggg tta tat gaa tca att gag gag tgc Pro Gly Thr Phe Asp Ile Gly Gly Leu Tyr Glu Ser Ile Glu Glu Cys 355 360 365	1103
ctg att aat gat ccc tgg gtt ttg ctc aat gca tct tgg ttc aac tcc Leu Ile Asn Asp Pro Trp Val Leu Leu Asn Ala Ser Trp Phe Asn Ser 370 375 380	1151
ttc ctt aca cat gca ctg aag tagttgtagc aatgctacta tttgctatcc Phe Leu Thr His Ala Leu Lys 385 390	1202
atactgtcca aaaaagtacc ttgtttctac t	1233

<210> 81
 <211> 390
 <212> PRT
 <213> Equine influenza virus H3N8

<400> 81

Glu Lys Gly Ile Asn Pro Asn Tyr Leu Gln Ala Trp Lys Gln Val Leu
 1 5 10 15

Ala Glu Leu Gln Asp Leu Glu Asn Glu Glu Lys Thr Pro Lys Thr Lys
 20 25 30

Asn Met Lys Lys Thr Ser Gln Leu Lys Trp Ala Leu Gly Glu Asn Met
 35 40 45

Ala Pro Glu Lys Val Asp Phe Glu Asp Cys Lys Asp Ile Asn Asp Leu
 50 55 60

Lys Gln Tyr Asp Ser Asp Glu Pro Glu Thr Arg Ser Leu Ala Ser Trp
 65 70 75 80

Ile Gln Ser Glu Phe Asn Lys Ala Cys Glu Leu Thr Asp Ser Ser Trp
 85 90 95

Ile Glu Leu Asp Glu Ile Gly Glu Asp Ile Ala Pro Ile Glu Tyr Ile
 100 105 110

Ala Ser Met Arg Arg Asn Tyr Phe Thr Ala Glu Val Ser His Cys Arg
 115 120 125

Ala Thr Glu Tyr Ile Met Lys Gly Val Tyr Ile Asn Thr Ala Leu Leu
 130 135 140

Asn Ala Ser Cys Ala Ala Met Asp Glu Phe Gln Leu Ile Pro Met Ile
 145 150 155 160

Ser Lys Cys Arg Thr Lys Glu Gly Arg Arg Lys Thr Asn Leu Tyr Gly
 165 170 175

Phe Ile Ile Lys Gly Arg Ser His Leu Arg Asn Asp Thr Asp Val Val
 180 185 190

Asn Phe Val Ser Met Glu Phe Ser Leu Thr Asp Pro Arg Phe Glu Pro
 195 200 205

His Lys Trp Glu Lys Tyr Cys Val Leu Glu Ile Gly Asp Met Leu Leu
 210 215 220

Arg Thr Ala Val Gly Gln Val Ser Arg Pro Met Phe Leu Tyr Val Arg
 225 230 235 240

Thr Asn Gly Thr Ser Lys Ile Lys Met Lys Trp Gly Met Glu Met Arg
 245 250 255

Arg Cys Leu Leu Gln Ser Leu Gln Gln Ile Glu Ser Met Ile Glu Ala
 260 265 270

Glu Ser Ser Val Lys Glu Lys Asp Met Thr Lys Glu Phe Phe Glu Asn
 275 280 285

Lys Ser Glu Thr Trp Pro Ile Gly Glu Ser Pro Lys Gly Val Glu Glu
 290 295 300

Gly Ser Ile Gly Lys Val Cys Arg Thr Leu Leu Ala Lys Ser Val Phe
 305 310 315 320

Asn Ser Leu Tyr Ala Ser Pro Gln Leu Glu Gly Phe Ser Ala Glu Ser
 325 330 335

Arg Lys Leu Leu Leu Ile Val Gln Ala Leu Arg Asp Asn Leu Glu Pro
 340 345 350

Gly Thr Phe Asp Ile Gly Gly Leu Tyr Glu Ser Ile Glu Glu Cys Leu
 355 360 365

Ile Asn Asp Pro Trp Val Leu Leu Asn Ala Ser Trp Phe Asn Ser Phe
 370 375 380

Leu Thr His Ala Leu Lys
 385 390

<210> 82
 <211> 1170
 <212> DNA
 <213> Equine influenza virus H3N8

<400> 82
 gaaaagggtta taaacccaaa ctatctccaa gcttgggaagc aagtattagc agaactacaa 60
 gaccttgaga acgaagaaaa gacccttaag accaagaata tgaaaaaac aagccaattg 120
 aaatgggcac tcggtgaaaa tatggcacca gagaaagtgg attttgagga ttgtaaagac 180

atcaatgatt tgaacagta tgacagtgat gagccagaaa caaggtctct tgcaagttgg	240
attcaaagtg agttcaaca agcttgtag ctgacagatt caagctggat agagctcgat	300
gaaattgggg aggatattgc cccaatagaa tacattgcga gcatgaggag aaattatddd	360
actgctgagg tttcccattg tagagcaaca gaatatataa tgaaggagggt gtacatcaac	420
actgctctac tcaatgcatt ctgtgctgag atggatgaat tccaattaat tccgatgata	480
agcaaatgca ggaccaaaga agggagaagg aagacaaatt tatatggatt cataataaag	540
ggaagggtcc atttaaggaa tgataccgac gtggtaaaact ttgtaagtat ggaatdddct	600
ctcactgatt caagatttga gccacataaa tgggaaaaat actgcgttct agaaattgga	660
gacatgctcc taaggactgc tgtaggtcaa gtgtcaagac ccatgttttt gtatgtaagg	720
acaaatggaa cctctaaaat taaaatgaaa tggggaatgg aaatgagacg ctgcctcctt	780
cagtctctgc aacagattga aagcatgatt gaagctgagt cctcagtcaa agaaaaggac	840
atgaccaaag aattctttga gaacaaatca gagacatggc ctataggaga gtccccaaa	900
ggagtggaa agggctcaat cggaagggt tgcaggacct tattagcaaa atctgtgttt	960
aacagtttgt atgcatctcc acaactggaa gggttttcag ctgaatctag gaaattactt	1020
ctcattgttc aggcccttag ggataacctg gaacctggaa ctttgatat tgggggggta	1080
tatgaatcaa ttgaggagt cctgattaat gatccctggg ttttgctcaa tgcattcttg	1140
ttcaactcct tccttacaca tgcactgaag	1170

<210> 83
 <211> 25
 <212> DNA
 <213> Artificial sequence

<220>
 <223> Synthetic Primer

<400> 83	
ggggcgggta cccaaactat ctcca	25

<210> 84
 <211> 27
 <212> DNA
 <213> Artificial sequence

<220>
 <223> Synthetic Primer

<400> 84	
gggggctcga gtactttttt ggacagt	27

<210> 85
 <211> 1234
 <212> DNA
 <213> Equine influenza virus H3N8

<220>
 <221> CDS
 <222> (1)..(1188)
 <223>

<400> 85
 atg aaa ttg aga act caa ata cca gca gaa atg ctc gca agc att gat 48
 Met Lys Leu Arg Thr Gln Ile Pro Ala Glu Met Leu Ala Ser Ile Asp
 1 5 10 15

ctg aaa tat ttc aat gat tca aca aaa aag aaa att gag aag ata cga 96
 Leu Lys Tyr Phe Asn Asp Ser Thr Lys Lys Lys Ile Glu Lys Ile Arg
 20 25 30

cca ctt ctg gtc gat ggg act gct tca ctg agt cct ggc atg atg atg 144
 Pro Leu Leu Val Asp Gly Thr Ala Ser Leu Ser Pro Gly Met Met Met
 35 40 45

gga atg ttc aac atg ttg agc act gta cta ggt gta tcc ata tta aac 192
 Gly Met Phe Asn Met Leu Ser Thr Val Leu Gly Val Ser Ile Leu Asn
 50 55 60

ctg ggc cag agg aaa tac aca aag acc aca tac tgg tgg gat ggt ctg 240
 Leu Gly Gln Arg Lys Tyr Thr Lys Thr Thr Tyr Trp Trp Asp Gly Leu
 65 70 75 80

caa tca tcc gat gat ttt gct ttg ata gtg aat gcg cct aat cat gaa 288
 Gln Ser Ser Asp Asp Phe Ala Leu Ile Val Asn Ala Pro Asn His Glu
 85 90 95

gga ata cag gct gga gta gac aga ttc tat aga act tgc aaa ctg gtc 336
 Gly Ile Gln Ala Gly Val Asp Arg Phe Tyr Arg Thr Cys Lys Leu Val
 100 105 110

ggg atc aac atg agc aaa aag aag tcc tac ata aat aga acc ggc aca 384
 Gly Ile Asn Met Ser Lys Lys Lys Ser Tyr Ile Asn Arg Thr Gly Thr
 115 120 125

ttc gaa ttc aca agc ttt ttc tac cgg tat ggt ttt gtc gcc aat ttc 432
 Phe Glu Phe Thr Ser Phe Phe Tyr Arg Tyr Gly Phe Val Ala Asn Phe
 130 135 140

agc atg gag cta ccc agt ttt ggg gtt tcc ggg ata aat gaa tct gca 480
 Ser Met Glu Leu Pro Ser Phe Gly Val Ser Gly Ile Asn Glu Ser Ala
 145 150 155 160

gac atg agc att gga atg aca gtt atc aaa aac aac atg ata aat aat 528
 Asp Met Ser Ile Gly Met Thr Val Ile Lys Asn Asn Met Ile Asn Asn
 165 170 175

gat ctc ggt ccc gcc acg gca caa atg gca ctc caa ctc ttc att aag 576
 Asp Leu Gly Pro Ala Thr Ala Gln Met Ala Leu Gln Leu Phe Ile Lys

180	185	190	
gat tat cgg tac aca tac cgg tgc cat aga ggc gat acc cag ata caa			624
Asp Tyr Arg Tyr Thr Tyr Arg Cys His Arg Gly Asp Thr Gln Ile Gln			
195	200	205	
acc aga aga tcc ttt gag ttg aag aaa ctg tgg gaa cag act cga tca			672
Thr Arg Arg Ser Phe Glu Leu Lys Lys Leu Trp Glu Gln Thr Arg Ser			
210	215	220	
aag act ggt cta ctg gta tca gat ggg ggt cca aac cta tac aac atc			720
Lys Thr Gly Leu Leu Val Ser Asp Gly Gly Pro Asn Leu Tyr Asn Ile			
225	230	235	240
aga aac cta cac atc ccg gaa gtc tgt ttg aaa tgg gag ctg atg gat			768
Arg Asn Leu His Ile Pro Glu Val Cys Leu Lys Trp Glu Leu Met Asp			
245	250	255	
gaa gat tat aaa ggg agg cta tgt aat cca ttg aat cct ttc gtt agc			816
Glu Asp Tyr Lys Gly Arg Leu Cys Asn Pro Leu Asn Pro Phe Val Ser			
260	265	270	
cac aaa gaa att gaa tca gtg aac agt gca gta gta atg cct gcg cat			864
His Lys Glu Ile Glu Ser Val Asn Ser Ala Val Val Met Pro Ala His			
275	280	285	
ggc cct gcc aaa agc atg gag tat gat gct gtt gca aca aca cac tct			912
Gly Pro Ala Lys Ser Met Glu Tyr Asp Ala Val Ala Thr Thr His Ser			
290	295	300	
tgg atc ccc aag agg aac cgg tcc ata ttg aac aca agt caa agg gga			960
Trp Ile Pro Lys Arg Asn Arg Ser Ile Leu Asn Thr Ser Gln Arg Gly			
305	310	315	320
ata ctc gaa gat gag cag atg tat cag aaa tgc tgc aac ctg ttt gaa			1008
Ile Leu Glu Asp Glu Gln Met Tyr Gln Lys Cys Cys Asn Leu Phe Glu			
325	330	335	
aaa ttc ttc ccc agc agc tca tac aga aga cca gtc gga att tct agt			1056
Lys Phe Phe Pro Ser Ser Ser Tyr Arg Arg Pro Val Gly Ile Ser Ser			
340	345	350	
atg gtt gag gcc atg gtg tcc agg gcc cgc att gat gca cga att gac			1104
Met Val Glu Ala Met Val Ser Arg Ala Arg Ile Asp Ala Arg Ile Asp			
355	360	365	
ttc gaa tct gga cgg ata aag aag gat gag ttc gct gag atc atg aag			1152
Phe Glu Ser Gly Arg Ile Lys Lys Asp Glu Phe Ala Glu Ile Met Lys			
370	375	380	
atc tgt tcc acc att gaa gag ctc aga cgg caa aaa tagtgaattt			1198
Ile Cys Ser Thr Ile Glu Glu Leu Arg Arg Gln Lys			
385	390	395	
agcttgatct tcgtgaaaaa atgccttggt tctact			1234

<210> 86

<211> 396

<212> PRT

<213> Equine influenza virus H3N8

<400> 86

Met Lys Leu Arg Thr Gln Ile Pro Ala Glu Met Leu Ala Ser Ile Asp
 1 5 10 15

Leu Lys Tyr Phe Asn Asp Ser Thr Lys Lys Lys Ile Glu Lys Ile Arg
 20 25 30

Pro Leu Leu Val Asp Gly Thr Ala Ser Leu Ser Pro Gly Met Met Met
 35 40 45

Gly Met Phe Asn Met Leu Ser Thr Val Leu Gly Val Ser Ile Leu Asn
 50 55 60

Leu Gly Gln Arg Lys Tyr Thr Lys Thr Thr Tyr Trp Trp Asp Gly Leu
 65 70 75 80

Gln Ser Ser Asp Asp Phe Ala Leu Ile Val Asn Ala Pro Asn His Glu
 85 90 95

Gly Ile Gln Ala Gly Val Asp Arg Phe Tyr Arg Thr Cys Lys Leu Val
 100 105 110

Gly Ile Asn Met Ser Lys Lys Lys Ser Tyr Ile Asn Arg Thr Gly Thr
 115 120 125

Phe Glu Phe Thr Ser Phe Phe Tyr Arg Tyr Gly Phe Val Ala Asn Phe
 130 135 140

Ser Met Glu Leu Pro Ser Phe Gly Val Ser Gly Ile Asn Glu Ser Ala
 145 150 155 160

Asp Met Ser Ile Gly Met Thr Val Ile Lys Asn Asn Met Ile Asn Asn
 165 170 175

Asp Leu Gly Pro Ala Thr Ala Gln Met Ala Leu Gln Leu Phe Ile Lys
 180 185 190

Asp Tyr Arg Tyr Thr Tyr Arg Cys His Arg Gly Asp Thr Gln Ile Gln
 195 200 205

Thr Arg Arg Ser Phe Glu Leu Lys Lys Leu Trp Glu Gln Thr Arg Ser
 210 215 220

Lys Thr Gly Leu Leu Val Ser Asp Gly Gly Pro Asn Leu Tyr Asn Ile
 225 230 235 240

Arg Asn Leu His Ile Pro Glu Val Cys Leu Lys Trp Glu Leu Met Asp
 245 250 255

Glu Asp Tyr Lys Gly Arg Leu Cys Asn Pro Leu Asn Pro Phe Val Ser
 260 265 270

His Lys Glu Ile Glu Ser Val Asn Ser Ala Val Val Met Pro Ala His
 275 280 285

Gly Pro Ala Lys Ser Met Glu Tyr Asp Ala Val Ala Thr Thr His Ser
 290 295 300

Trp Ile Pro Lys Arg Asn Arg Ser Ile Leu Asn Thr Ser Gln Arg Gly
 305 310 315 320

Ile Leu Glu Asp Glu Gln Met Tyr Gln Lys Cys Cys Asn Leu Phe Glu
 325 330 335

Lys Phe Phe Pro Ser Ser Ser Tyr Arg Arg Pro Val Gly Ile Ser Ser
 340 345 350

Met Val Glu Ala Met Val Ser Arg Ala Arg Ile Asp Ala Arg Ile Asp
 355 360 365

Phe Glu Ser Gly Arg Ile Lys Lys Asp Glu Phe Ala Glu Ile Met Lys
 370 375 380

Ile Cys Ser Thr Ile Glu Glu Leu Arg Arg Gln Lys
 385 390 395

<210> 87
 <211> 1188
 <212> DNA
 <213> Equine influenza virus H3N8

<400> 87
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 aatgattcaa caaaaaagaa aattgagaag atacgaaccac ttctgggtcga tgggactgct 120
 tcaactgagtc ctggcatgat gatgggaatg ttcaacatgt tgagcactgt actaggtgta 180
 tccatattaa acctgggcca gaggaaatac acaaagacca catactggtg ggatggtctg 240

EQ-1-C2-1.ST25.txt

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caatcatccg atgattttgc tttgatagtg aatgcgccta atcatgaagg aatacaggct 300
ggagtagaca gattctatag aacttgcaaa ctggtcggga tcaacatgag caaaaagaag 360
tctacataa atagaaccgg cacattcgaa ttcacaagct ttttctaccg gtatgggtttt 420
gtcgccaatt tcagcatgga gctaccaggt tttgggggttt ccgggataaa tgaatctgca 480
gacatgagca ttggaatgac agttatcaaa aacaacatga taaataatga tctcggtccc 540
gccacggcac aaatggcact ccaactcttc attaaggatt atcggtacac ataccggtgc 600
catagaggcg ataccagat acaaacaga agatcctttg agttgaagaa actgtgggaa 660
cagactcgat caaagactgg tctactggta tcagatgggg gtccaaacct atacaacatc 720
agaaacctac acatcccgga agtctgtttg aaatgggagc tgatggatga agattataaa 780
gggaggctat gtaatccatt gaatcctttc gttagccaca aagaaattga atcagtgaac 840
agtgcagtag taatgcctgc gcatggccct gccaaaagca tggagtatga tgctgttgca 900
acaacacact cttggatccc caagaggaac cgggtccatat tgaacacaag tcaaagggga 960
atactcgaag atgagcagat gtatcagaaa tgctgcaacc tgtttgaaaa attcttcccc 1020
agcagctcat acagaagacc agtcggaatt tctagtatgg ttgaggccat ggtgtccagg 1080
gcccgcattg atgcacgaat tgacttcgaa tctggacgga taaagaagga tgagttcgct 1140
gagatcatga agatctgttc caccattgaa gagctcagac ggcaaaaa 1188

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<210> 88
 <211> 1240
 <212> DNA
 <213> Equine influenza virus H3N8

<220>
 <221> CDS
 <222> (8)..(1195)
 <223>

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<400> 88
caaaagt atg aaa ttg aga act caa ata cca gca gaa atg ctc gca agc 49
      Met Lys Leu Arg Thr Gln Ile Pro Ala Glu Met Leu Ala Ser
      1              5              10

att gat ctg aaa tat ttc aat gat tca aca aaa aag aaa att gag aag 97
Ile Asp Leu Lys Tyr Phe Asn Asp Ser Thr Lys Lys Lys Ile Glu Lys
15              20              25              30

ata cga cca ctt ctg gtc gat ggg act gct tca ctg agt cct ggc atg 145
Ile Arg Pro Leu Leu Val Asp Gly Thr Ala Ser Leu Ser Pro Gly Met
      35              40              45

atg atg gga atg ttc aac atg ttg agc act gta cta ggt gta tcc ata 193

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EQ-1-C2-1.ST25.txt

Met Met Gly Met Phe Asn Met Leu Ser Thr Val Leu Gly Val Ser Ile	
50 55 60	
tta aac ctg ggc cag agg aaa tac aca aag acc aca tac tgg tgg gat	241
Leu Asn Leu Gly Gln Arg Lys Tyr Thr Lys Thr Tyr Trp Trp Asp	
65 70 75	
ggt ctg caa tca tcc gat gat ttt gct ttg ata gtg aat gcg cct aat	289
Gly Leu Gln Ser Ser Asp Asp Phe Ala Leu Ile Val Asn Ala Pro Asn	
80 85 90	
cat gaa gga ata cag gct gga gta gac aga ttc tat aga act tgc aaa	337
His Glu Gly Ile Gln Ala Gly Val Asp Arg Phe Tyr Arg Thr Cys Lys	
95 100 105 110	
ctg gtc ggg atc aac atg agc aaa aag aag tcc tac ata aat aga acc	385
Leu Val Gly Ile Asn Met Ser Lys Lys Lys Ser Tyr Ile Asn Arg Thr	
115 120 125	
ggc tca ttc gaa ttc aca agc ttt ttc tac cgg tat ggt ttt gtc gcc	433
Gly Ser Phe Glu Phe Thr Ser Phe Phe Tyr Arg Tyr Gly Phe Val Ala	
130 135 140	
aat ttc agc atg gag cta ccc agt ttt ggg gtt tcc ggg ata aat gaa	481
Asn Phe Ser Met Glu Leu Pro Ser Phe Gly Val Ser Gly Ile Asn Glu	
145 150 155	
tct gca gac atg agc att gga atg aca gtt atc aaa aac aac atg ata	529
Ser Ala Asp Met Ser Ile Gly Met Thr Val Ile Lys Asn Asn Met Ile	
160 165 170	
aat aat gat ctc ggt ccc gcc acg gca caa atg gca ctc caa ctc ttc	577
Asn Asn Asp Leu Gly Pro Ala Thr Ala Gln Met Ala Leu Gln Leu Phe	
175 180 185 190	
att aag gat tat cgg tac aca tac cgg tgc cat aga ggc gat acc cag	625
Ile Lys Asp Tyr Arg Tyr Thr Tyr Arg Cys His Arg Gly Asp Thr Gln	
195 200 205	
ata caa acc aga aga tcc ttt gag ttg aag aaa ctg tgg gaa cag act	673
Ile Gln Thr Arg Arg Ser Phe Glu Leu Lys Lys Leu Trp Glu Gln Thr	
210 215 220	
cga tca aag act ggt cta ctg gta tca gat ggg ggt cca aac cta tac	721
Arg Ser Lys Thr Gly Leu Leu Val Ser Asp Gly Gly Pro Asn Leu Tyr	
225 230 235	
aac atc aga aac cta cac atc ccg gaa gtc tgt ttg aaa tgg gag ctg	769
Asn Ile Arg Asn Leu His Ile Pro Glu Val Cys Leu Lys Trp Glu Leu	
240 245 250	
atg gat gaa gat tat aaa ggg agg cta tgt aat cca ttg aat cct ttc	817
Met Asp Glu Asp Tyr Lys Gly Arg Leu Cys Asn Pro Leu Asn Pro Phe	
255 260 265 270	
gtt agc cac aaa gaa att gaa tca gtg aac agt gca gta gta atg cct	865
Val Ser His Lys Glu Ile Glu Ser Val Asn Ser Ala Val Val Met Pro	
275 280 285	

EQ-1-C2-1.ST25.txt

gcg cat ggc cct gcc aaa agc atg gag tat gat gct gtt gca aca aca 913
 Ala His Gly Pro Ala Lys Ser Met Glu Tyr Asp Ala Val Ala Thr Thr
 290 295 300

cac tct tgg atc ccc aag agg aac cgg tcc ata ttg aac aca agt caa 961
 His Ser Trp Ile Pro Lys Arg Asn Arg Ser Ile Leu Asn Thr Ser Gln
 305 310 315

agg gga ata ctc gaa gat gag cag atg tat cag aaa tgc tgc aac ctg 1009
 Arg Gly Ile Leu Glu Asp Glu Gln Met Tyr Gln Lys Cys Cys Asn Leu
 320 325 330

ttt gaa aaa ttc ttc ccc agc agc tca tac aga aga cca gtc gga att 1057
 Phe Glu Lys Phe Phe Pro Ser Ser Ser Tyr Arg Arg Pro Val Gly Ile
 335 340 345 350

tct. agt atg gtt gag gcc atg gtg tcc agg gcc cgc att gat gca cga 1105
 Ser Ser Met Val Glu Ala Met Val Ser Arg Ala Arg Ile Asp Ala Arg
 355 360 365

att gac ttc gaa tct gga cgg ata aag aag gat gag ttc gct gag atc 1153
 Ile Asp Phe Glu Ser Gly Arg Ile Lys Lys Asp Glu Phe Ala Glu Ile
 370 375 380

atg aag atc tgt tcc acc att gaa gag ctc aga cgg caa aaa 1195
 Met Lys Ile Cys Ser Thr Ile Glu Glu Leu Arg Arg Gln Lys
 385 390 395

tagtgaattt agcttgatct tcgtgaaaaa atgccttggt ctact 1240

<210> 89

<211> 396

<212> PRT

<213> Equine influenza virus H3N8

<400> 89

Met Lys Leu Arg Thr Gln Ile Pro Ala Glu Met Leu Ala Ser Ile Asp
 1 5 10 15

Leu Lys Tyr Phe Asn Asp Ser Thr Lys Lys Lys Ile Glu Lys Ile Arg
 20 25 30

Pro Leu Leu Val Asp Gly Thr Ala Ser Leu Ser Pro Gly Met Met Met
 35 40 45

Gly Met Phe Asn Met Leu Ser Thr Val Leu Gly Val Ser Ile Leu Asn
 50 55 60

Leu Gly Gln Arg Lys Tyr Thr Lys Thr Thr Tyr Trp Trp Asp Gly Leu
 65 70 75 80

Gln Ser Ser Asp Asp Phe Ala Leu Ile Val Asn Ala Pro Asn His Glu

Gly Ile Gln Ala Gly Val Asp Arg Phe Tyr Arg Thr Cys Lys Leu Val
 100 105 110

Gly Ile Asn Met Ser Lys Lys Lys Ser Tyr Ile Asn Arg Thr Gly Ser
 115 120 125

Phe Glu Phe Thr Ser Phe Phe Tyr Arg Tyr Gly Phe Val Ala Asn Phe
 130 135 140

Ser Met Glu Leu Pro Ser Phe Gly Val Ser Gly Ile Asn Glu Ser Ala
 145 150 155 160

Asp Met Ser Ile Gly Met Thr Val Ile Lys Asn Asn Met Ile Asn Asn
 165 170 175

Asp Leu Gly Pro Ala Thr Ala Gln Met Ala Leu Gln Leu Phe Ile Lys
 180 185 190

Asp Tyr Arg Tyr Thr Tyr Arg Cys His Arg Gly Asp Thr Gln Ile Gln
 195 200 205

Thr Arg Arg Ser Phe Glu Leu Lys Lys Leu Trp Glu Gln Thr Arg Ser
 210 215 220

Lys Thr Gly Leu Leu Val Ser Asp Gly Gly Pro Asn Leu Tyr Asn Ile
 225 230 235 240

Arg Asn Leu His Ile Pro Glu Val Cys Leu Lys Trp Glu Leu Met Asp
 245 250 255

Glu Asp Tyr Lys Gly Arg Leu Cys Asn Pro Leu Asn Pro Phe Val Ser
 260 265 270

His Lys Glu Ile Glu Ser Val Asn Ser Ala Val Val Met Pro Ala His
 275 280 285

Gly Pro Ala Lys Ser Met Glu Tyr Asp Ala Val Ala Thr Thr His Ser
 290 295 300

Trp Ile Pro Lys Arg Asn Arg Ser Ile Leu Asn Thr Ser Gln Arg Gly
 305 310 315 320

EQ-1-C2-1.ST25.txt

Ile Leu Glu Asp Glu Gln Met Tyr Gln Lys Cys Cys Asn Leu Phe Glu
 325 330 335

Lys Phe Phe Pro Ser Ser Ser Tyr Arg Arg Pro Val Gly Ile Ser Ser
 -- 340 345 350

Met Val Glu Ala Met Val Ser Arg Ala Arg Ile Asp Ala Arg Ile Asp
 355 360 365

Phe Glu Ser Gly Arg Ile Lys Lys Asp Glu Phe Ala Glu Ile Met Lys
 370 375 380

Ile Cys Ser Thr Ile Glu Glu Leu Arg Arg Gln Lys
 385 390 395

<210> 90
 <211> 1188
 <212> DNA
 <213> Equine influenza virus H3N8

<400> 90
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 aatgattcaa caaaaaagaa aattgagaag atacgaccac ttctggtcga tgggactgct 120
 tcaactgagtc ctggcatgat gatgggaatg ttcaacatgt tgagcactgt actaggtgta 180
 tccatattaa acctgggccca gaggaataac acaaagacca catactggtg ggatggtctg 240
 caatcatccg atgattttgc tttgatagtg aatgcgccta atcatgaagg aatacaggct 300
 ggagtagaca gattctatag aacttgcaaa ctggctcgga tcaacatgag caaaaagaag 360
 tcctacataa atagaaccgg ctcatcgaa ttcacaagct ttttctaccg gtatggtttt 420
 gtcgccaaatt tcagcatgga gctaccaggt tttggggttt cggggataaa tgaatctgca 480
 gacatgagca ttggaatgac agttatcaaa aacaacatga taaataatga tctcggtccc 540
 gccacggcac aaatggcact ccaactcttc attaaggatt atcggtacac ataccggtgc 600
 catagaggcg ataccagat acaaaccaga agatcctttg agttgaagaa actgtgggaa 660
 cagactcgat caaagactgg tctactggta tcagatgggg gtccaaacct atacaacatc 720
 agaaacctac acatcccgga agtctgtttg aaatgggagc tgatggatga agattataaa 780
 gggaggctat gtaatccatt gaatcctttc gttagccaca aagaaattga atcagtgaac 840
 agtgcagtag taatgcctgc gcatggccct gccaaaagca tggagtatga tgctgttgca 900
 acaacacact cttggatccc caagaggaac cgggtccatat tgaacacaag tcaaagggga 960
 atactcgaag atgagcagat gtatcagaaa tgctgcaacc tgtttgaaaa attcttcccc 1020

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agcagctcat acagaagacc agtcggaatt tctagtatgg ttgaggccat ggtgtccagg 1080
gcccgcatgtg atgcacgaat tgacttcgaa tctggacgga taaagaagga tgagttcgct 1140
gagatcatga agatctgttc caccattgaa gagctcagac ggcaaaaa 1188

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<210> 91
<211> 1241
<212> DNA
<213> Equine influenza virus H3N8

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<220>
<221> CDS
<222> (8)..(1195)
<223>

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<400> 91
caaaagt atg aaa ttg aga act caa ata cca gca gaa atg ctc gca agc 49
      Met Lys Leu Arg Thr Gln Ile Pro Ala Glu Met Leu Ala Ser
      1 5 10

att gat ctg aaa tat ttc aat gat tca aca aaa aag aaa att gag aag 97
Ile Asp Leu Lys Tyr Phe Asn Asp Ser Thr Lys Lys Lys Ile Glu Lys
15 20 25 30

ata cga cca ctt ctg gtc gat ggg act gct tca ctg agt cct ggc atg 145
Ile Arg Pro Leu Leu Val Asp Gly Thr Ala Ser Leu Ser Pro Gly Met
35 40 45

atg atg gga atg ttc aac atg ttg agc act gta cta ggt gta tcc ata 193
Met Met Gly Met Phe Asn Met Leu Ser Thr Val Leu Gly Val Ser Ile
50 55 60

tta aac ctg ggc cag agg aaa tac aca aag acc aca tac tgg tgg gat 241
Leu Asn Leu Gly Gln Arg Lys Tyr Thr Lys Thr Thr Tyr Trp Trp Asp
65 70 75

ggt ctg caa tca tcc gat gat ttt gct ttg ata gtg aat gcg cct aat 289
Gly Leu Gln Ser Ser Asp Asp Phe Ala Leu Ile Val Asn Ala Pro Asn
80 85 90

cat gaa gga ata cag gct gga gta gac aga ttc tat aga act tgc aaa 337
His Glu Gly Ile Gln Ala Gly Val Asp Arg Phe Tyr Arg Thr Cys Lys
95 100 105 110

ctg gtc ggg atc aac atg agc aaa aag aag tcc tac ata aat aga acc 385
Leu Val Gly Ile Asn Met Ser Lys Lys Lys Ser Tyr Ile Asn Arg Thr
115 120 125

ggc aca ttc gaa ttc aca agc ttt ttc tac cgg tat ggt ttt gtc gcc 433
Gly Thr Phe Glu Phe Thr Ser Phe Phe Tyr Arg Tyr Gly Phe Val Ala
130 135 140

aat ttc agc atg gag cta ccc agt ttt ggg gtt tcc ggg ata aat gaa 481
Asn Phe Ser Met Glu Leu Pro Ser Phe Gly Val Ser Gly Ile Asn Glu
145 150 155

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tct gca gac atg agc att gga atg aca gtt atc aaa aac aac atg ata Ser Ala Asp Met Ser Ile Gly Met Thr Val Ile Lys Asn Asn Met Ile 160 165 170	529
aat aat gat ctc ggt ccc gcc acg gca caa atg gca ctc caa ctc ttc Asn Asn Asp Leu Gly Pro Ala Thr Ala Gln Met Ala Leu Gln Leu Phe 175 180 185 190	577
att aag gat tat cgg tac aca tac cgg tgt caa aga ggc gat acc cag Ile Lys Asp Tyr Arg Tyr Thr Tyr Arg Cys Gln Arg Gly Asp Thr Gln 195 200 205	625
ata caa acc aga aga tcc ttt gag ttg aag aaa ctg tgg gaa cag act Ile Gln Thr Arg Arg Ser Phe Glu Leu Lys Lys Leu Trp Glu Gln Thr 210 215 220	673
cga tca aag act ggt cta ctg gta tca gat ggg ggt cca aac cta tac Arg Ser Lys Thr Gly Leu Leu Val Ser Asp Gly Gly Pro Asn Leu Tyr 225 230 235	721
aac atc aga aac cta cac atc ccg gaa gtc tgt ttg aaa tgg gag ctg Asn Ile Arg Asn Leu His Ile Pro Glu Val Cys Leu Lys Trp Glu Leu 240 245 250	769
atg gat gaa gat tat aaa ggg agg cta tgt aat cca ttg aat cct ttc Met Asp Glu Asp Tyr Lys Gly Arg Leu Cys Asn Pro Leu Asn Pro Phe 255 260 265 270	817
gtt agc cac aaa gaa att gaa tca gtg aac agt gca gta gta atg cct Val Ser His Lys Glu Ile Glu Ser Val Asn Ser Ala Val Val Met Pro 275 280 285	865
gcg cat ggc cct gcc aaa agc atg gag tat gat gct gtt gca aca aca Ala His Gly Pro Ala Lys Ser Met Glu Tyr Asp Ala Val Ala Thr Thr 290 295 300	913
cac tct tgg atc ccc aag agg aac cgg tcc ata ttg aac aca agt caa His Ser Trp Ile Pro Lys Arg Asn Arg Ser Ile Leu Asn Thr Ser Gln 305 310 315	961
agg gga ata ctc gaa gat gag cag atg tat cag aaa tgc tgc aac ctg Arg Gly Ile Leu Glu Asp Glu Gln Met Tyr Gln Lys Cys Cys Asn Leu 320 325 330	1009
ttt gaa aaa ttc ttc ccc agc agc tca tac aga aaa cca gtc gga att Phe Glu Lys Phe Phe Pro Ser Ser Ser Tyr Arg Lys Pro Val Gly Ile 335 340 345 350	1057
tct agt atg gtt gag gcc atg gtg tcc agg gcc cgc att gat gca cga Ser Ser Met Val Glu Ala Met Val Ser Arg Ala Arg Ile Asp Ala Arg 355 360 365	1105
att gac ttc gaa tct gga cgg ata aag aag gat gag ttc gct gag atc Ile Asp Phe Glu Ser Gly Arg Ile Lys Lys Asp Glu Phe Ala Glu Ile 370 375 380	1153
atg aag atc tgt tcc acc att gaa gag ctc aga cgg caa aaa Met Lys Ile Cys Ser Thr Ile Glu Glu Leu Arg Arg Gln Lys	1195

385

390

395

tagtgaattt agcttgatct tcgtgaaaaa atgccttggt tctact

1241

<210> 92

<211> 396

<212> PRT

<213> Equine influenza virus H3N8

<400> 92

Met Lys Leu Arg Thr Gln Ile Pro Ala Glu Met Leu Ala Ser Ile Asp
 1 5 10 15

Leu Lys Tyr Phe Asn Asp Ser Thr Lys Lys Lys Ile Glu Lys Ile Arg
 20 25 30

Pro Leu Leu Val Asp Gly Thr Ala Ser Leu Ser Pro Gly Met Met Met
 35 40 45

Gly Met Phe Asn Met Leu Ser Thr Val Leu Gly Val Ser Ile Leu Asn
 50 55 60

Leu Gly Gln Arg Lys Tyr Thr Lys Thr Thr Tyr Trp Trp Asp Gly Leu
 65 70 75 80

Gln Ser Ser Asp Asp Phe Ala Leu Ile Val Asn Ala Pro Asn His Glu
 85 90 95

Gly Ile Gln Ala Gly Val Asp Arg Phe Tyr Arg Thr Cys Lys Leu Val
 100 105 110

Gly Ile Asn Met Ser Lys Lys Lys Ser Tyr Ile Asn Arg Thr Gly Thr
 115 120 125

Phe Glu Phe Thr Ser Phe Phe Tyr Arg Tyr Gly Phe Val Ala Asn Phe
 130 135 140

Ser Met Glu Leu Pro Ser Phe Gly Val Ser Gly Ile Asn Glu Ser Ala
 145 150 155 160

Asp Met Ser Ile Gly Met Thr Val Ile Lys Asn Asn Met Ile Asn Asn
 165 170 175

Asp Leu Gly Pro Ala Thr Ala Gln Met Ala Leu Gln Leu Phe Ile Lys
 180 185 190

Asp Tyr Arg Tyr Thr Tyr Arg Cys Gln Arg Gly Asp Thr Gln Ile Gln
 195 200 205

Thr Arg Arg Ser Phe Glu Leu Lys Lys Leu Trp Glu Gln Thr Arg Ser
 210 215 220

Lys Thr Gly Leu Leu Val Ser Asp Gly Gly Pro Asn Leu Tyr Asn Ile
 225 230 235 240

Arg Asn Leu His Ile Pro Glu Val Cys Leu Lys Trp Glu Leu Met Asp
 245 250 255

Glu Asp Tyr Lys Gly Arg Leu Cys Asn Pro Leu Asn Pro Phe Val Ser
 260 265 270

His Lys Glu Ile Glu Ser Val Asn Ser Ala Val Val Met Pro Ala His
 275 280 285

Gly Pro Ala Lys Ser Met Glu Tyr Asp Ala Val Ala Thr Thr His Ser
 290 295 300

Trp Ile Pro Lys Arg Asn Arg Ser Ile Leu Asn Thr Ser Gln Arg Gly
 305 310 315 320

Ile Leu Glu Asp Glu Gln Met Tyr Gln Lys Cys Cys Asn Leu Phe Glu
 325 330 335

Lys Phe Phe Pro Ser Ser Ser Tyr Arg Lys Pro Val Gly Ile Ser Ser
 340 345 350

Met Val Glu Ala Met Val Ser Arg Ala Arg Ile Asp Ala Arg Ile Asp
 355 360 365

Phe Glu Ser Gly Arg Ile Lys Lys Asp Glu Phe Ala Glu Ile Met Lys
 370 375 380

Ile Cys Ser Thr Ile Glu Glu Leu Arg Arg Gln Lys
 385 390 395

<210> 93
 <211> 1188
 <212> DNA
 <213> Equine influenza virus H3N8

<400> 93

EQ-1-C2-1.ST25.txt

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atgaaattga gaactcaa at accagcagaa atgctcgcaa gcattgatct gaaatatttc 60
aatgattcaa caaaaaagaa aattgagaag atacgaccac ttctgggtcga tgggactgct 120
tactgagtc ctggcatgat gatgggaatg ttcaacatgt tgagcactgt actaggtgta 180
tccatattaa acctgggcca gaggaatac acaaagacca catactgggtg ggatgggtctg 240
caatcatccg atgatttttgc tttgatagt atgctgccta atcatgaagg aatacaggct 300
ggagtagaca gattctatag aacttgcaaa ctgggtcgga tcaacatgag caaaaagaag 360
tcctacataa atagaaccgg cacattcgaa ttcacaagct ttttctaccg gtatgggtttt 420
gtcgccaatt tcagcatgga gctaccagc tttggggttt ccgggataaa tgaatctgca 480
gacatgagca ttggaatgac agttatcaaa aacaacatga taaataatga tctcggtccc 540
gccacggcac aaatggcact ccaactcttc attaaggatt atcggtacac ataccggtgt 600
caaagaggcg ataccagat acaaaccaga agatcctttg agttgaagaa actgtgggaa 660
cagactcgat caaagactgg tctactggta tcagatgggg gtccaaacct atacaacatc 720
agaaacctac acatcccgga agtctgtttg aaatgggagc tgatggatga agattataaa 780
gggaggctat gtaatccatt gaatcctttc gttagccaca aagaaattga atcagtgaac 840
agtgcagtag taatgcctgc gcatggccct gccaaaagca tggagtatga tgctgttgca 900
acaacacact cttggatccc caagaggaac cgggtccat atgaacacaag tcaaagggga 960
atactcgaag atgagcagat gtatcagaaa tgctgcaacc tgtttgaaaa attcttcccc 1020
agcagctcat acagaaaacc agtcggaatt tctagtatgg ttgaggccat ggtgtccagg 1080
gcccgcattg atgcacgaat tgacttcgaa tctggacgga taaagaagga tgagtctgct 1140
gagatcatga agatctgttc caccattgaa gagctcagac ggcaaaaa 1188

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<210> 94
<211> 1241
<212> DNA
<213> Equine influenza virus H3N8

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<220>
<221> CDS
<222> (8)..(1195)
<223>

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<400> 94
caaaagt atg aaa ttg aga act caa ata cca gca gaa atg ctc gca agc 49
Met Lys Leu Arg Thr Gln Ile Pro Ala Glu Met Leu Ala Ser
1 5 10

att gat ctg aaa tat ttc aat gat tca aca aaa aag aaa att gag aag 97
Ile Asp Leu Lys Tyr Phe Asn Asp Ser Thr Lys Lys Lys Ile Glu Lys

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EQ-1-C2-1.ST25.txt

15	20	25	30	
ata cga cca ctt ctg gtc gat ggg act gct tca ctg agt cct ggc atg				145
Ile Arg Pro Leu Leu Val Asp Gly Thr Ala Ser Leu Ser Pro Gly Met				
	35	40	45	
atg atg gga atg ttc aac atg ttg agc act gta cta ggt gta tcc ata				193
Met Met Gly Met Phe Asn Met Leu Ser Thr Val Leu Gly Val Ser Ile				
	50	55	60	
tta aac ctg ggc cag agg aaa tac aca aag acc aca tac tgg tgg gat				241
Leu Asn Leu Gly Gln Arg Lys Tyr Thr Lys Thr Thr Tyr Trp Trp Asp				
	65	70	75	
ggt ctg caa tca tcc gat gat ttt gct ttg ata gtg aat gcg cct aat				289
Gly Leu Gln Ser Ser Asp Asp Phe Ala Leu Ile Val Asn Ala Pro Asn				
	80	85	90	
cat gaa gga ata cag gct gga gta gac aga ttc tat aga act tgc aaa				337
His Glu Gly Ile Gln Ala Gly Val Asp Arg Phe Tyr Arg Thr Cys Lys				
	95	100	105	110
ctg gtc ggg atc aac atg agc aaa aag aag tcc tac ata aat aga acc				385
Leu Val Gly Ile Asn Met Ser Lys Lys Lys Ser Tyr Ile Asn Arg Thr				
	115	120	125	
ggc aca ttc gaa ttc aca agc ttt ttc tac cgg tat ggt ttt gtc gcc				433
Gly Thr Phe Glu Phe Thr Ser Phe Phe Tyr Arg Tyr Gly Phe Val Ala				
	130	135	140	
aat ttc agc atg gag cta ccc agt ttt ggg gtt tcc ggg ata aat gaa				481
Asn Phe Ser Met Glu Leu Pro Ser Phe Gly Val Ser Gly Ile Asn Glu				
	145	150	155	
tct gca gac atg agc att gga atg aca gtt atc aaa aac aac atg ata				529
Ser Ala Asp Met Ser Ile Gly Met Thr Val Ile Lys Asn Asn Met Ile				
	160	165	170	
aat aat gat ctc ggt ccc gcc acg gca caa atg gca ctc caa ctc ttc				577
Asn Asn Asp Leu Gly Pro Ala Thr Ala Gln Met Ala Leu Gln Leu Phe				
	175	180	185	190
att aag gat tat cgg tac aca tac cgg tgt caa aga ggc gat acc cag				625
Ile Lys Asp Tyr Arg Tyr Thr Tyr Arg Cys Gln Arg Gly Asp Thr Gln				
	195	200	205	
ata caa acc aga aga tcc ttt gag ttg aag aaa ctg tgg gaa cag act				673
Ile Gln Thr Arg Arg Ser Phe Glu Leu Lys Lys Leu Trp Glu Gln Thr				
	210	215	220	
cga tca aag act ggt cta ctg gta tca gat ggg ggt cca aac cta tac				721
Arg Ser Lys Thr Gly Leu Leu Val Ser Asp Gly Gly Pro Asn Leu Tyr				
	225	230	235	
aac atc aga aac cta cac atc ccg gaa gtc tgt ttg aaa tgg gag ctg				769
Asn Ile Arg Asn Leu His Ile Pro Glu Val Cys Leu Lys Trp Glu Leu				
	240	245	250	
atg gat gaa gat tat aaa ggg agg cta tgt aat cca ttg aat cct ttc				817

EQ-1-C2-1.ST25.txt

Met Asp Glu Asp Tyr Lys Gly Arg Leu Cys Asn Pro Leu Asn Pro Phe
 255 260 265 270

gtt agc cac aaa gaa att gaa tca gtg aac agt gca gta gta atg cct 865
 Val Ser His Lys Glu Ile Glu Ser Val Asn Ser Ala Val Val Met Pro
 275 280 285

gcg cat ggc cct gcc aaa agc atg gag tat gat gct gtt gca aca aca 913
 Ala His Gly Pro Ala Lys Ser Met Glu Tyr Asp Ala Val Ala Thr Thr
 290 295 300

cac tct tgg atc ccc aag agg aac cgg tcc ata ttg aac aca agt caa 961
 His Ser Trp Ile Pro Lys Arg Asn Arg Ser Ile Leu Asn Thr Ser Gln
 305 310 315

agg gga ata ctc gaa gat gag cag atg tat cag aaa tgc tgc aac ctg 1009
 Arg Gly Ile Leu Glu Asp Glu Gln Met Tyr Gln Lys Cys Cys Asn Leu
 320 325 330

ttt gaa aaa ttc ttc ccc agc agc tca tac aga aga cca gtc gga att 1057
 Phe Glu Lys Phe Phe Pro Ser Ser Ser Tyr Arg Arg Pro Val Gly Ile
 335 340 345 350

tct agt atg gtt gag gcc atg gtg tcc agg gcc cgc att gat gca cga 1105
 Ser Ser Met Val Glu Ala Met Val Ser Arg Ala Arg Ile Asp Ala Arg
 355 360 365

att gac ttc gaa tct gga cgg ata aag aag gat gag ttc gct gag atc 1153
 Ile Asp Phe Glu Ser Gly Arg Ile Lys Lys Asp Glu Phe Ala Glu Ile
 370 375 380

atg aag atc tgt tcc acc att gaa gag ctc aga cgg caa aaa 1195
 Met Lys Ile Cys Ser Thr Ile Glu Glu Leu Arg Arg Gln Lys
 385 390 395

tagtgaattt agcttgatct tcgtgaaaaa atgccttggtt tctact 1241

<210> 95
 <211> 396
 <212> PRT
 <213> Equine influenza virus H3N8

<400> 95

Met Lys Leu Arg Thr Gln Ile Pro Ala Glu Met Leu Ala Ser Ile Asp
 1 5 10 15

Leu Lys Tyr Phe Asn Asp Ser Thr Lys Lys Lys Ile Glu Lys Ile Arg
 20 25 30

Pro Leu Leu Val Asp Gly Thr Ala Ser Leu Ser Pro Gly Met Met Met
 35 40 45

Gly Met Phe Asn Met Leu Ser Thr Val Leu Gly Val Ser Ile Leu Asn
 50 55 60

Leu Gly Gln Arg Lys Tyr Thr Lys Thr Thr Tyr Trp Trp Asp Gly Leu
 65 70 75 80
 Gln Ser Ser Asp Asp Phe Ala Leu Ile Val Asn Ala Pro Asn His Glu
 85 90 95
 Gly Ile Gln Ala Gly Val Asp Arg Phe Tyr Arg Thr Cys Lys Leu Val
 100 105 110
 Gly Ile Asn Met Ser Lys Lys Lys Ser Tyr Ile Asn Arg Thr Gly Thr
 115 120 125
 Phe Glu Phe Thr Ser Phe Phe Tyr Arg Tyr Gly Phe Val Ala Asn Phe
 130 135 140
 Ser Met Glu Leu Pro Ser Phe Gly Val Ser Gly Ile Asn Glu Ser Ala
 145 150 155 160
 Asp Met Ser Ile Gly Met Thr Val Ile Lys Asn Asn Met Ile Asn Asn
 165 170 175
 Asp Leu Gly Pro Ala Thr Ala Gln Met Ala Leu Gln Leu Phe Ile Lys
 180 185 190
 Asp Tyr Arg Tyr Thr Tyr Arg Cys Gln Arg Gly Asp Thr Gln Ile Gln
 195 200 205
 Thr Arg Arg Ser Phe Glu Leu Lys Lys Leu Trp Glu Gln Thr Arg Ser
 210 215 220
 Lys Thr Gly Leu Leu Val Ser Asp Gly Gly Pro Asn Leu Tyr Asn Ile
 225 230 235 240
 Arg Asn Leu His Ile Pro Glu Val Cys Leu Lys Trp Glu Leu Met Asp
 245 250 255
 Glu Asp Tyr Lys Gly Arg Leu Cys Asn Pro Leu Asn Pro Phe Val Ser
 260 265 270
 His Lys Glu Ile Glu Ser Val Asn Ser Ala Val Val Met Pro Ala His
 275 280 285
 Gly Pro Ala Lys Ser Met Glu Tyr Asp Ala Val Ala Thr Thr His Ser

290

295

300

Trp Ile Pro Lys Arg Asn Arg Ser Ile Leu Asn Thr Ser Gln Arg Gly
 305 310 315 320

Ile Leu Glu Asp Glu Gln Met Tyr Gln Lys Cys Cys Asn Leu Phe Glu
 325 330 335

Lys Phe Phe Pro Ser Ser Ser Tyr Arg Arg Pro Val Gly Ile Ser Ser
 340 345 350

Met. Val Glu Ala Met Val Ser Arg Ala Arg Ile Asp Ala Arg Ile Asp
 355 360 365

Phe Glu Ser Gly Arg Ile Lys Lys Asp Glu Phe Ala Glu Ile Met Lys
 370 375 380

Ile Cys Ser Thr Ile Glu Glu Leu Arg Arg Gln Lys
 385 390 395

<210> 96
 <211> 1188
 <212> DNA
 <213> Equine influenza virus H3N8

<400> 96
 atgaaattga gaactcaa accagcagaa atgctcgcaa gcattgatct gaaatatttc 60
 aatgattcaa caaaaaagaa aattgagaag atacgaccac ttctggtcga tgggactgct 120
 tcaactgagtc ctggcatgat gatgggaatg ttcaacatgt tgagcactgt actaggtgta 180
 tccatattaa acctgggcca gaggaatac acaaagacca catactggtg ggatggtctg 240
 caatcatccg atgattttgc tttgatagtg aatgcgccta atcatgaagg aatacaggct 300
 ggagtagaca gattctatag aacttgcaaa ctggtcggga tcaacatgag caaaaagaag 360
 tcctacataa atagaaccgg cacattcgaa ttcacaagct ttttctaccg gtatgggttt 420
 gtcgccaaatt tcagcatgga gctacccagt tttgggggtt cggggataaa tgaatctgca 480
 gacatgagca ttggaatgac agttatcaaa aacaacatga taaataatga tctcgggtccc 540
 gccacggcac aaatggcact ccaactcttc attaaggatt atcgggtacac ataccggtgt 600
 caaagaggcg ataccagat acaaaccaga agatcctttg agttgaagaa actgtgggaa 660
 cagactcgat caaagactgg tctactggta tcagatgggg gtccaaacct atacaacatc 720
 agaaacctac acatcccgga agtctgtttg aaatgggagc tgatggatga agattataaa 780

EQ-1-C2-1.ST25.txt

```

gggaggctat gtaatccatt gaatcctttc gttagccaca aagaaattga atcagtgaac      840
agtgagtag  taatgcctgc gcatggccct gccaaaagca tggagtatga tgctgttgca      900
acaacacact cttggatccc caagaggaac cgggccatat tgaacacaag tcaaagggga      960
atactcgaag atgagcagat gtatcagaaa tgctgcaacc tgtttgaaaa attcttcccc     1020
agcagctcat acagaagacc agtcggaatt tctagtatgg ttgaggccat ggtgtccagg     1080
gcccgcatg  atgcacgaat tgacttcgaa tctggacgga taaagaagga tgagttcgct     1140
gagatcatga agatctgttc caccattgaa gagctcagac ggcaaaaaa                  1188

```

```

<210> 97
<211> 20
<212> DNA
<213> Artificial sequence

```

```

<220>
<223> Synthetic Primer

```

```

<400> 97
taaatagaac cggcacattc                                                    20

```

```

<210> 98
<211> 17
<212> DNA
<213> Artificial sequence

```

```

<220>
<223> Synthetic Primer

```

```

<400> 98
caaagaaatt gaatcag                                                       17

```

```

<210> 99
<211> 18
<212> DNA
<213> Artificial sequence

```

```

<220>
<223> Synthetic Primer

```

```

<400> 99
caagcattac tactgcac                                                       18

```

```

<210> 100
<211> 19
<212> DNA
<213> Artificial sequence

```

```

<220>
<223> Synthetic Primer

```

```

<400> 100
agtctgttcc cacagtttc
19

<210> 101
<211> 20
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 101
gaattcgaat gtgccggttc
20

<210> 102
<211> 20
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic Primer

<400> 102
aaaacaagga ttttttcacg
20

<210> 103
<211> 2341
<212> DNA
<213> Equine influenza virus H3N8

<220>
<221> CDS
<222> (25)..(2295)
<223>

<220>
<221> misc_feature
<222> (1489)..(1489)
<223> At nucleotide 1489, w = a or t/u
At amino acid residue 489, Xaa = Thr or Ser

<400> 103
agcaaaagca ggcaaactat ttga atg gat gtc aat ccg act cta ctc ttc
Met Asp Val Asn Pro Thr Leu Leu Phe
1 5
51

tta aag gtg cca gcg caa aat gct ata agc aca aca ttc cct tat act
Leu Lys Val Pro Ala Gln Asn Ala Ile Ser Thr Thr Phe Pro Tyr Thr
10 15 20 25
99

gga gat cct ccc tac agt cat gga aca ggg aca gga tac acc atg gat
Gly Asp Pro Pro Tyr Ser His Gly Thr Gly Thr Gly Tyr Thr Met Asp
30 35 40
147

```


EQ-1-C2-1.ST25.txt

act gtc aac aga aca cat caa tac tca gaa aag ggg aaa tgg aca aca	195
Thr Val Asn Arg Thr His Gln Tyr Ser Glu Lys Gly Lys Trp Thr Thr	
45 50 55	
aac act gag att gga gca cca caa ctt aat cca atc gat gga ccg ctt	243
Asn Thr Glu Ile Gly Ala Pro Gln Leu Asn Pro Ile Asp Gly Pro Leu	
60 65 70	
cct gaa gac aat gaa cca agt ggg tac gcc caa aca gat tgt gta ttg	291
Pro Glu Asp Asn Glu Pro Ser Gly Tyr Ala Gln Thr Asp Cys Val Leu	
75 80 85	
gaa gca atg gct ttc ctt gaa gaa tcc cat ccc gga atc ttt gaa aat	339
Glu Ala Met Ala Phe Leu Glu Glu Ser His Pro Gly Ile Phe Glu Asn	
90 95 100 105	
tcg tgt ctt gaa aca atg gag gtg gtt cag cag aca aga gtg gac aaa	387
Ser Cys Leu Glu Thr Met Glu Val Val Gln Gln Thr Arg Val Asp Lys	
110 115 120	
cta aca caa ggc cga caa act tac gat tgg acc ttg aat agg aat caa	435
Leu Thr Gln Gly Arg Gln Thr Tyr Asp Trp Thr Leu Asn Arg Asn Gln	
125 130 135	
cct gcc gca aca gca ctt gct aat aca att gaa gtg ttc aga tca aat	483
Pro Ala Ala Thr Ala Leu Ala Asn Thr Ile Glu Val Phe Arg Ser Asn	
140 145 150	
gat ctg act tcc agt gag tca ggg aga tta atg gac ttc ctc aaa gat	531
Asp Leu Thr Ser Ser Glu Ser Gly Arg Leu Met Asp Phe Leu Lys Asp	
155 160 165	
gtc atg gag tcc atg aac aag gaa gaa atg gaa ata aca aca cac ttc	579
Val Met Glu Ser Met Asn Lys Glu Glu Met Glu Ile Thr Thr His Phe	
170 175 180 185	
caa cgg aag aga aga gta aga gac aac atg aca aag aga atg gtg aca	627
Gln Arg Lys Arg Arg Val Arg Asp Asn Met Thr Lys Arg Met Val Thr	
190 195 200	
cag aga acc ata ggg aag aaa aaa caa cga tta aac aga aag agc tat	675
Gln Arg Thr Ile Gly Lys Lys Lys Gln Arg Leu Asn Arg Lys Ser Tyr	
205 210 215	
ctg atc agg gca tta acc tta aac aca atg acc aag gac gct gag aga	723
Leu Ile Arg Ala Leu Thr Leu Asn Thr Met Thr Lys Asp Ala Glu Arg	
220 225 230	
ggg aaa ttg aaa cga cga gca att gca acc cca gga atg cag ata aga	771
Gly Lys Leu Lys Arg Arg Ala Ile Ala Thr Pro Gly Met Gln Ile Arg	
235 240 245	
ggg ttt gta tat ttt gtt gaa aca tta gcc cga aga ata tgt gaa aag	819
Gly Phe Val Tyr Phe Val Glu Thr Leu Ala Arg Arg Ile Cys Glu Lys	
250 255 260 265	
ctt gaa caa tca gga ttg cca gtt ggc ggt aat gag aaa aag gcc aaa	867
Leu Glu Gln Ser Gly Leu Pro Val Gly Gly Asn Glu Lys Lys Ala Lys	
270 275 280	

EQ-1-C2-1.ST25.txt

ctg gct aat gtc gtc aga aaa atg atg act aat tcc caa gac act gaa Leu Ala Asn Val Val Arg Lys Met Met Thr Asn Ser Gln Asp Thr Glu 285 290 295	915
ctc tcc ttc acc atc act ggg gac aat acc aaa tgg aat gaa aat cag Leu Ser Phe Thr Ile Thr Gly Asp Asn Thr Lys Trp Asn Glu Asn Gln 300 305 310	963
aac cca cgc atg ttc ctg gca atg atc aca tac ata act aga aac cag Asn Pro Arg Met Phe Leu Ala Met Ile Thr Tyr Ile Thr Arg Asn Gln 315 320 325	1011
cca gaa tgg ttc aga aat gtt cta agc att gca ccg att atg ttc tca Pro Glu Trp Phe Arg Asn Val Leu Ser Ile Ala Pro Ile Met Phe Ser 330 335 340 345	1059
aat aaa atg gca aga ctg ggg aaa gga tat atg ttt gaa agc aaa agt Asn Lys Met Ala Arg Leu Gly Lys Gly Tyr Met Phe Glu Ser Lys Ser 350 355 360	1107
atg aaa ttg aga act caa ata cca gca gaa atg ctc gca agc att gat Met Lys Leu Arg Thr Gln Ile Pro Ala Glu Met Leu Ala Ser Ile Asp 365 370 375	1155
ctg aaa tat ttc aat gat tca aca aaa aag aaa att gag aag ata cga Leu Lys Tyr Phe Asn Asp Ser Thr Lys Lys Lys Ile Glu Lys Ile Arg 380 385 390	1203
cca ctt ctg gtc gat ggg act gct tca ctg agt cct ggc atg atg atg Pro Leu Leu Val Asp Gly Thr Ala Ser Leu Ser Pro Gly Met Met Met 395 400 405	1251
gga atg ttc aac atg ttg agc act gta cta ggt gta tcc ata tta aac Gly Met Phe Asn Met Leu Ser Thr Val Leu Gly Val Ser Ile Leu Asn 410 415 420 425	1299
ctg ggc cag agg aaa tac aca aag acc aca tac tgg tgg gat ggt ctg Leu Gly Gln Arg Lys Tyr Thr Lys Thr Thr Tyr Trp Trp Asp Gly Leu 430 435 440	1347
caa tca tcc gat gat ttt gct ttg ata gtg aat gcg cct aat cat gaa Gln Ser Ser Asp Asp Phe Ala Leu Ile Val Asn Ala Pro Asn His Glu 445 450 455	1395
gga ata cag gct gga gta gac aga ttc tat aga act tgc aaa ctg gtc Gly Ile Gln Ala Gly Val Asp Arg Phe Tyr Arg Thr Cys Lys Leu Val 460 465 470	1443
ggg atc aac atg agc aaa aag aag tcc tac ata aat aga acc ggc wca Gly Ile Asn Met Ser Lys Lys Lys Ser Tyr Ile Asn Arg Thr Gly Xaa 475 480 485	1491
ttc gaa ttc aca agc ttt ttc tac cgg tat ggt ttt gtc gcc aat ttc Phe Glu Phe Thr Ser Phe Phe Tyr Arg Tyr Gly Phe Val Ala Asn Phe 490 495 500 505	1539
agc atg gag cta ccc agt ttt ggg gtt tcc ggg ata aat gaa tct gca Ser Met Glu Leu Pro Ser Phe Gly Val Ser Gly Ile Asn Glu Ser Ala	1587

510	515	520	
gac atg agc att gga atg aca gtt atc aaa aac aac atg ata aat aat Asp Met Ser Ile Gly Met Thr Val Ile Lys Asn Asn Met Ile Asn Asn 525 530 535			1635
gat ctc ggt ccc gcc acg gca caa atg gca ctc caa ctc ttc att aag Asp Leu Gly Pro Ala Thr Ala Gln Met Ala Leu Gln Leu Phe Ile Lys 540 545 550			1683
gat tat cgg tac aca tac cgg tgc cat aga ggc gat acc cag ata caa Asp Tyr Arg Tyr Thr Tyr Arg Cys His Arg Gly Asp Thr Gln Ile Gln 555 560 565			1731
acc aga aga tcc ttt gag ttg aag aaa ctg tgg gaa cag act cga tca Thr Arg Arg Ser Phe Glu Leu Lys Lys Leu Trp Glu Gln Thr Arg Ser 570 575 580 585			1779
aag act ggt cta ctg gta tca gat ggg ggt cca aac cta tac aac atc Lys Thr Gly Leu Leu Val Ser Asp Gly Gly Pro Asn Leu Tyr Asn Ile 590 595 600			1827
aga aac cta cac atc ccg gaa gtc tgt ttg aaa tgg gag ctg atg gat Arg Asn Leu His Ile Pro Glu Val Cys Leu Lys Trp Glu Leu Met Asp 605 610 615			1875
gaa gat tat aaa ggg agg cta tgt aat cca ttg aat cct ttc gtt agc Glu Asp Tyr Lys Gly Arg Leu Cys Asn Pro Leu Asn Pro Phe Val Ser 620 625 630			1923
cac aaa gaa att gaa tca gtg aac agt gca gta gta atg cct gcg cat His Lys Glu Ile Glu Ser Val Asn Ser Ala Val Val Met Pro Ala His 635 640 645			1971
ggc cct gcc aaa agc atg gag tat gat gct gtt gca aca aca cac tct Gly Pro Ala Lys Ser Met Glu Tyr Asp Ala Val Ala Thr Thr His Ser 650 655 660 665			2019
tgg atc ccc aag agg aac cgg tcc ata ttg aac aca agt caa agg gga Trp Ile Pro Lys Arg Asn Arg Ser Ile Leu Asn Thr Ser Gln Arg Gly 670 675 680			2067
ata ctc gaa gat gag cag atg tat cag aaa tgc tgc aac ctg ttt gaa Ile Leu Glu Asp Glu Gln Met Tyr Gln Lys Cys Cys Asn Leu Phe Glu 685 690 695			2115
aaa ttc ttc ccc agc agc tca tac aga aga cca gtc gga att tct agt Lys Phe Phe Pro Ser Ser Ser Tyr Arg Arg Pro Val Gly Ile Ser Ser 700 705 710			2163
atg gtt gag gcc atg gtg tcc agg gcc cgc att gat gca cga att gac Met Val Glu Ala Met Val Ser Arg Ala Arg Ile Asp Ala Arg Ile Asp 715 720 725			2211
ttc gaa tct gga cgg ata aag aag gat gag ttc gct gag atc atg aag Phe Glu Ser Gly Arg Ile Lys Lys Asp Glu Phe Ala Glu Ile Met Lys 730 735 740 745			2259
atc tgt tcc acc att gaa gag ctc aga cgg caa aaa tagtgaattt			2305

Ile Cys Ser Thr Ile Glu Glu Leu Arg Arg Gln Lys
750 755

agcttgatct tcgtgaaaaa atgccttggt tctact

2341

<210> 104

<211> 757

<212> PRT

<213> Equine influenza virus H3N8

<220>

<221> misc_feature

<222> (489)..(489)

<223> The 'Xaa' at location 489 stands for Thr or Ser

<400> 104

Met Asp Val Asn Pro Thr Leu Leu Phe Leu Lys Val Pro Ala Gln Asn
1 5 10 15

Ala Ile Ser Thr Thr Phe Pro Tyr Thr Gly Asp Pro Pro Tyr Ser His
20 25 30

Gly Thr Gly Thr Gly Tyr Thr Met Asp Thr Val Asn Arg Thr His Gln
35 40 45

Tyr Ser Glu Lys Gly Lys Trp Thr Thr Asn Thr Glu Ile Gly Ala Pro
50 55 60

Gln Leu Asn Pro Ile Asp Gly Pro Leu Pro Glu Asp Asn Glu Pro Ser
65 70 75 80

Gly Tyr Ala Gln Thr Asp Cys Val Leu Glu Ala Met Ala Phe Leu Glu
85 90 95

Glu Ser His Pro Gly Ile Phe Glu Asn Ser Cys Leu Glu Thr Met Glu
100 105 110

Val Val Gln Gln Thr Arg Val Asp Lys Leu Thr Gln Gly Arg Gln Thr
115 120 125

Tyr Asp Trp Thr Leu Asn Arg Asn Gln Pro Ala Ala Thr Ala Leu Ala
130 135 140

Asn Thr Ile Glu Val Phe Arg Ser Asn Asp Leu Thr Ser Ser Glu Ser
145 150 155 160

Gly Arg Leu Met Asp Phe Leu Lys Asp Val Met Glu Ser Met Asn Lys

165

170

175

Glu Glu Met Glu Ile Thr Thr His Phe Gln Arg Lys Arg Arg Val Arg
180 185 190

Asp Asn Met Thr Lys Arg Met Val Thr Gln Arg Thr Ile Gly Lys Lys
195 200 205

Lys Gln Arg Leu Asn Arg Lys Ser Tyr Leu Ile Arg Ala Leu Thr Leu
210 215 220

Asn Thr Met Thr Lys Asp Ala Glu Arg Gly Lys Leu Lys Arg Arg Ala
225 230 235 240

Ile Ala Thr Pro Gly Met Gln Ile Arg Gly Phe Val Tyr Phe Val Glu
245 250 255

Thr Leu Ala Arg Arg Ile Cys Glu Lys Leu Glu Gln Ser Gly Leu Pro
260 265 270

Val Gly Gly Asn Glu Lys Lys Ala Lys Leu Ala Asn Val Val Arg Lys
275 280 285

Met Met Thr Asn Ser Gln Asp Thr Glu Leu Ser Phe Thr Ile Thr Gly
290 295 300

Asp Asn Thr Lys Trp Asn Glu Asn Gln Asn Pro Arg Met Phe Leu Ala
305 310 315 320

Met Ile Thr Tyr Ile Thr Arg Asn Gln Pro Glu Trp Phe Arg Asn Val
325 330 335

Leu Ser Ile Ala Pro Ile Met Phe Ser Asn Lys Met Ala Arg Leu Gly
340 345 350

Lys Gly Tyr Met Phe Glu Ser Lys Ser Met Lys Leu Arg Thr Gln Ile
355 360 365

Pro Ala Glu Met Leu Ala Ser Ile Asp Leu Lys Tyr Phe Asn Asp Ser
370 375 380

Thr Lys Lys Lys Ile Glu Lys Ile Arg Pro Leu Leu Val Asp Gly Thr
385 390 395 400

EQ-1-C2-1.ST25.txt

Ala Ser Leu Ser Pro Gly Met Met Met Gly Met Phe Asn Met Leu Ser
 405 410 415
 Thr Val Leu Gly Val Ser Ile Leu Asn Leu Gly Gln Arg Lys Tyr Thr
 420 425 430
 Lys Thr Thr Tyr Trp Trp Asp Gly Leu Gln Ser Ser Asp Asp Phe Ala
 435 440 445
 Leu Ile Val Asn Ala Pro Asn His Glu Gly Ile Gln Ala Gly Val Asp
 450 455 460
 Arg Phe Tyr Arg Thr Cys Lys Leu Val Gly Ile Asn Met Ser Lys Lys
 465 470 475 480
 Lys Ser Tyr Ile Asn Arg Thr Gly Xaa Phe Glu Phe Thr Ser Phe Phe
 485 490 495
 Tyr Arg Tyr Gly Phe Val Ala Asn Phe Ser Met Glu Leu Pro Ser Phe
 500 505 510
 Gly Val Ser Gly Ile Asn Glu Ser Ala Asp Met Ser Ile Gly Met Thr
 515 520 525
 Val Ile Lys Asn Asn Met Ile Asn Asn Asp Leu Gly Pro Ala Thr Ala
 530 535 540
 Gln Met Ala Leu Gln Leu Phe Ile Lys Asp Tyr Arg Tyr Thr Tyr Arg
 545 550 555 560
 Cys His Arg Gly Asp Thr Gln Ile Gln Thr Arg Arg Ser Phe Glu Leu
 565 570 575
 Lys Lys Leu Trp Glu Gln Thr Arg Ser Lys Thr Gly Leu Leu Val Ser
 580 585 590
 Asp Gly Gly Pro Asn Leu Tyr Asn Ile Arg Asn Leu His Ile Pro Glu
 595 600 605
 Val Cys Leu Lys Trp Glu Leu Met Asp Glu Asp Tyr Lys Gly Arg Leu
 610 615 620
 Cys Asn Pro Leu Asn Pro Phe Val Ser His Lys Glu Ile Glu Ser Val
 625 630 635 640

EQ-1-C2-1.ST25.txt

Asn Ser Ala Val Val Met Pro Ala His Gly Pro Ala Lys Ser Met Glu
645 650 655

Tyr Asp Ala Val Ala Thr Thr His Ser Trp Ile Pro Lys Arg Asn Arg
660 665 670

Ser Ile Leu Asn Thr Ser Gln Arg Gly Ile Leu Glu Asp Glu Gln Met
675 680 685

Tyr Gln Lys Cys Cys Asn Leu Phe Glu Lys Phe Phe Pro Ser Ser Ser
690 695 700

Tyr Arg Arg Pro Val Gly Ile Ser Ser Met Val Glu Ala Met Val Ser
705 710 715 720

Arg Ala Arg Ile Asp Ala Arg Ile Asp Phe Glu Ser Gly Arg Ile Lys
725 730 735

Lys Asp Glu Phe Ala Glu Ile Met Lys Ile Cys Ser Thr Ile Glu Glu
740 745 750

Leu Arg Arg Gln Lys
755

<210> 105
<211> 2271
<212> DNA
<213> Equine influenza virus H3N8

<400> 105
atggatgtca atccgactct actcttctta aaggtgccag cgcaaaatgc tataagcaca 60
acattccctt atactggaga tcctccctac agtcatggaa cagggacagg atacaccatg 120
gatactgtca acagaacaca tcaatactca gaaaagggga aatggacaac aaacactgag 180
attggagcac cacaacttaa tccaatcgat ggaccgcttc ctgaagacaa tgaaccaagt 240
gggtacgccc aaacagattg tgtattggaa gcaatggctt tccttgaaga atcccatccc 300
ggaatctttg aaaattcgtg tcttgaaaca atggaggtgg ttcagcagac aagagtggac 360
aaactaacac aaggccgaca aacttacgat tggaccttga ataggaatca acctgccgca 420
acagcacttg ctaatacaat tgaagtgttc agatcaaag atctgacttc cagtgaagtca 480
gggagattaa tggacttcct caaagatgtc atggagtcca tgaacaagga agaaatggaa 540
ataacaacac acttccaacg gaagagaaga gtaagagaca acatgacaaa gagaatggtg 600

EQ-1-C2-1.ST25.txt

acacagagaa ccatagggaa gaaaaaaca cgtataaaca gaaagagcta tctgatcagg 660
 gcattaacct taaacacaat gaccaaggac gctgagagag ggaaattgaa acgacgagca 720
 attgcaaccc caggaatgca gataagaggg tttgtatatt ttgttgaaac attagcccga 780
 agaatatgtg aaaagcttga acaatcagga ttgccagttg gcggtaatga gaaaaaggcc 840
 aaactgggcta atgtcgtcag aaaaatgatg actaattccc aagacactga actctccttc 900
 accatcactg gggacaatac caaatggaat gaaaatcaga acccacgcat gttcctggca 960
 atgatcacat acataactag aaaccagcca gaatggttca gaaatgttct aagcattgca 1020
 ccgattatgt tctcaaataa aatggcaaga ctggggaaaag gatatatgtt tgaaagcaaa 1080
 agtatgaaat tgagaactca aataccagca gaaatgctcg caagcattga tctgaaatat 1140
 ttcaatgatt caacaaaaaa gaaaattgag aagatacgac cacttctggg cgatgggact 1200
 gcttcactga gtcctggcat gatgatggga atgttcaaca tgttgagcac tgtactaggt 1260
 gtatccatat taaacctggg ccagaggaaa tacacaaaga ccacatactg gtgggatggt 1320
 ctgcaatcat ccgatgattt tgctttgata gtgaatgctg ctaatcatga aggaatacag 1380
 gctggagtag acagattcta tagaacttgc aaactggtcg ggatcaacat gagcaaaaaag 1440
 aagtccata taaatagaac cggcwcattc gaattcacia gcttttttcta ccggtatggt 1500
 tttgtcgcca atttcagcat ggagctaccc agttttgggg tttccgggat aaatgaatct 1560
 gcagacatga gcattggaat gacagttatc aaaaacaaca tgataaataa tgatctcggg 1620
 cccgccacgg cacaaatggc actccaactc ttcattaagg attatcggta cacataccgg 1680
 tgccatagag gcgataccca gatacaaacc agaagatcct ttgagttgaa gaaactgtgg 1740
 gaacagactc gatcaaagac tgggtctactg gtatcagatg ggggtccaaa cctatacaac 1800
 atcagaaacc tacacatccc ggaagtctgt ttgaaatggg agctgatgga tgaagattat 1860
 aaagggaggc tatgtaatcc attgaatcct ttcgttagcc acaaagaaat tgaatcagt 1920
 aacagtgcag tagtaatgcc tgcgcatggc cctgccaaaa gcatggagta tgatgctgtt 1980
 gcaacaacac actcttgat cccaagagg aaccgggtcca tattgaacac aagtcaaagg 2040
 ggaatactcg aagatgagca gatgtatcag aaatgctgca acctgttga aaaattcttc 2100
 cccagcagct catacagaag accagtcgga atttctagta tggttgaggc catggtgtcc 2160
 agggcccgca ttgatgcacg aattgacttc gaatctggac ggataaagaa ggatgagttc 2220
 gctgagatca tgaagatctg ttccaccatt gaagagctca gacggcaaaa a 2271

<210> 106
 <211> 2341

<212> DNA

<213> Equine influenza virus H3N8

<220>

<221> CDS

<222> (25)..(2295)

<223>

<220>

<221> misc_feature

<222> (2144)..(21434)

<223> At nucleotide 2144, r = a or g

At amino acid residue 707, Xaa = Arg or Lys

<400> 106

```

agcaaaagca ggcaaactat ttga atg gat gtc aat ccg act cta ctc ttc      51
                Met Asp Val Asn Pro Thr Leu Leu Phe
                  1                      5

```

```

tta aag gtg cca gcg caa aat gct ata agc aca aca ttc cct tat act      99
Leu Lys Val Pro Ala Gln Asn Ala Ile Ser Thr Thr Phe Pro Tyr Thr
10                      15                      20                      25

```

```

gga gat cct ccc tac agt cat gga aca ggg aca gga tac acc atg gat      147
Gly Asp Pro Pro Tyr Ser His Gly Thr Gly Thr Gly Tyr Thr Met Asp
                      30                      35                      40

```

```

act gtc aac aga aca cat caa tac tca gaa aag ggg aaa tgg aca aca      195
Thr Val Asn Arg Thr His Gln Tyr Ser Glu Lys Gly Lys Trp Thr Thr
                      45                      50                      55

```

```

aac act gag att gga gca cca caa ctt aat cca atc gat gga ccg ctt      243
Asn Thr Glu Ile Gly Ala Pro Gln Leu Asn Pro Ile Asp Gly Pro Leu
                      60                      65                      70

```

```

cct gaa gac aat gaa cca agt ggg tac gcc caa aca gat tgt gta ttg      291
Pro Glu Asp Asn Glu Pro Ser Gly Tyr Ala Gln Thr Asp Cys Val Leu
75                      80                      85

```

```

gaa gca atg gct ttc ctt gaa gaa tcc cat ccc gga atc ttt gaa aat      339
Glu Ala Met Ala Phe Leu Glu Glu Ser His Pro Gly Ile Phe Glu Asn
90                      95                      100                      105

```

```

tcg tgt ctt gaa aca atg gag gtg gtt cag cag aca aga gtg gac aaa      387
Ser Cys Leu Glu Thr Met Glu Val Val Gln Gln Thr Arg Val Asp Lys
                      110                      115                      120

```

```

cta aca caa ggc cga caa act tac gat tgg acc ttg aat agg aat caa      435
Leu Thr Gln Gly Arg Gln Thr Tyr Asp Trp Thr Leu Asn Arg Asn Gln
                      125                      130                      135

```

```

cct gcc gca aca gca ctt gct aat aca att gaa gtg ttc aga tca aat      483
Pro Ala Ala Thr Ala Leu Ala Asn Thr Ile Glu Val Phe Arg Ser Asn
140                      145                      150

```

```

gat ctg act tcc agt gag tca ggg aga tta atg gac ttc ctc aaa gat      531
Asp Leu Thr Ser Ser Glu Ser Gly Arg Leu Met Asp Phe Leu Lys Asp
155                      160                      165

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gtc atg gag tcc atg aac aag gaa gaa atg gaa ata aca aca cac ttc	579
Val Met Glu Ser Met Asn Lys Glu Glu Met Glu Ile Thr Thr His Phe	
170 175 180 185	
caa cgg aag aga aga gta aga gac aac atg aca aag aga atg gtg aca	627
Gln Arg Lys Arg Arg Val Arg Asp Asn Met Thr Lys Arg Met Val Thr	
190 195 200	
cag aga acc ata ggg aag aaa aaa caa cga tta aac aga aag agc tat	675
Gln Arg Thr Ile Gly Lys Lys Lys Gln Arg Leu Asn Arg Lys Ser Tyr	
205 210 215	
ctg atc agg gca tta acc tta aac aca atg acc aag gac gct gag aga	723
Leu Ile Arg Ala Leu Thr Leu Asn Thr Met Thr Lys Asp Ala Glu Arg	
220 225 230	
ggg aaa ttg aaa cga cga gca att gca acc cca gga atg cag ata aga	771
Gly Lys Leu Lys Arg Arg Ala Ile Ala Thr Pro Gly Met Gln Ile Arg	
235 240 245	
ggg ttt gta tat ttt gtt gaa aca tta gcc cga aga ata tgt gaa aag	819
Gly Phe Val Tyr Phe Val Glu Thr Leu Ala Arg Arg Ile Cys Glu Lys	
250 255 260 265	
ctt gaa caa tca gga ttg cca gtt ggc ggt aat gag aaa aag gcc aaa	867
Leu Glu Gln Ser Gly Leu Pro Val Gly Gly Asn Glu Lys Lys Ala Lys	
270 275 280	
ctg gct aat gtc gtc aga aaa atg atg act aat tcc caa gac act gaa	915
Leu Ala Asn Val Val Arg Lys Met Met Thr Asn Ser Gln Asp Thr Glu	
285 290 295	
ctc tcc ttc acc atc act ggg gac aat acc aaa tgg aat gaa aat cag	963
Leu Ser Phe Thr Ile Thr Gly Asp Asn Thr Lys Trp Asn Glu Asn Gln	
300 305 310	
aac cca cgc atg ttc ctg gca atg atc aca tac ata act aga aac cag	1011
Asn Pro Arg Met Phe Leu Ala Met Ile Thr Tyr Ile Thr Arg Asn Gln	
315 320 325	
cca gaa tgg ttc aga aat gtt cta agc att gca ccg att atg ttc tca	1059
Pro Glu Trp Phe Arg Asn Val Leu Ser Ile Ala Pro Ile Met Phe Ser	
330 335 340 345	
aat aaa atg gca aga ctg ggg aaa gga tat atg ttt gaa agc aaa agt	1107
Asn Lys Met Ala Arg Leu Gly Lys Gly Tyr Met Phe Glu Ser Lys Ser	
350 355 360	
atg aaa ttg aga act caa ata cca gca gaa atg ctc gca agc att gat	1155
Met Lys Leu Arg Thr Gln Ile Pro Ala Glu Met Leu Ala Ser Ile Asp	
365 370 375	
ctg aaa tat ttc aat gat tca aca aaa aag aaa att gag aag ata cga	1203
Leu Lys Tyr Phe Asn Asp Ser Thr Lys Lys Lys Ile Glu Lys Ile Arg	
380 385 390	
cca ctt ctg gtc gat ggg act gct tca ctg agt cct ggc atg atg atg	1251
Pro Leu Leu Val Asp Gly Thr Ala Ser Leu Ser Pro Gly Met Met Met	

395	400	405	
gga atg ttc aac atg ttg agc act gta cta ggt gta tcc ata tta aac			1299
Gly Met Phe Asn Met Leu Ser Thr Val Leu Gly Val Ser Ile Leu Asn			
410	415	420	425
ctg ggc cag agg aaa tac aca aag acc aca tac tgg tgg gat ggt ctg			1347
Leu Gly Gln Arg Lys Tyr Thr Lys Thr Thr Tyr Trp Trp Asp Gly Leu			
	430	435	440
caa tca tcc gat gat ttt gct ttg ata gtg aat gcg cct aat cat gaa			1395
Gln Ser Ser Asp Asp Phe Ala Leu Ile Val Asn Ala Pro Asn His Glu			
	445	450	455
gga ata cag gct gga gta gac aga ttc tat aga act tgc aaa ctg gtc			1443
Gly Ile Gln Ala Gly Val Asp Arg Phe Tyr Arg Thr Cys Lys Leu Val			
	460	465	470
ggg atc aac atg agc aaa aag aag tcc tac ata aat aga acc ggc aca			1491
Gly Ile Asn Met Ser Lys Lys Lys Ser Tyr Ile Asn Arg Thr Gly Thr			
	475	480	485
ttc gaa ttc aca agc ttt ttc tac cgg tat ggt ttt gtc gcc aat ttc			1539
Phe Glu Phe Thr Ser Phe Phe Tyr Arg Tyr Gly Phe Val Ala Asn Phe			
	490	495	500
agc atg gag cta ccc agt ttt ggg gtt tcc ggg ata aat gaa tct gca			1587
Ser Met Glu Leu Pro Ser Phe Gly Val Ser Gly Ile Asn Glu Ser Ala			
	510	515	520
gac atg agc att gga atg aca gtt atc aaa aac aac atg ata aat aat			1635
Asp Met Ser Ile Gly Met Thr Val Ile Lys Asn Asn Met Ile Asn Asn			
	525	530	535
gat ctc ggt ccc gcc acg gca caa atg gca ctc caa ctc ttc att aag			1683
Asp Leu Gly Pro Ala Thr Ala Gln Met Ala Leu Gln Leu Phe Ile Lys			
	540	545	550
gat tat cgg tac aca tac cgg tgt caa aga ggc gat acc cag ata caa			1731
Asp Tyr Arg Tyr Thr Tyr Arg Cys Gln Arg Gly Asp Thr Gln Ile Gln			
	555	560	565
acc aga aga tcc ttt gag ttg aag aaa ctg tgg gaa cag act cga tca			1779
Thr Arg Arg Ser Phe Glu Leu Lys Lys Leu Trp Glu Gln Thr Arg Ser			
	570	575	580
aag act ggt cta ctg gta tca gat ggg ggt cca aac cta tac aac atc			1827
Lys Thr Gly Leu Leu Val Ser Asp Gly Gly Pro Asn Leu Tyr Asn Ile			
	590	595	600
aga aac cta cac atc ccg gaa gtc tgt ttg aaa tgg gag ctg atg gat			1875
Arg Asn Leu His Ile Pro Glu Val Cys Leu Lys Trp Glu Leu Met Asp			
	605	610	615
gaa gat tat aaa ggg agg cta tgt aat cca ttg aat cct ttc gtt agc			1923
Glu Asp Tyr Lys Gly Arg Leu Cys Asn Pro Leu Asn Pro Phe Val Ser			
	620	625	630
cac aaa gaa att gaa tca gtg aac agt gca gta gta atg cct gcg cat			1971

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His Lys Glu Ile Glu Ser Val Asn Ser Ala Val Val Met Pro Ala His
 635 640 645
 ggc cct gcc aaa agc atg gag tat gat gct gtt gca aca aca cac tct 2019
 Gly Pro Ala Lys Ser Met Glu Tyr Asp Ala Val Ala Thr Thr His Ser
 650 655 660 665
 tgg atc ccc aag agg aac cgg tcc ata ttg aac aca agt caa agg gga 2067
 Trp Ile Pro Lys Arg Asn Arg Ser Ile Leu Asn Thr Ser Gln Arg Gly
 670 675 680
 ata ctc gaa gat gag cag atg tat cag aaa tgc tgc aac ctg ttt gaa 2115
 Ile Leu Glu Asp Glu Gln Met Tyr Gln Lys Cys Cys Asn Leu Phe Glu
 685 690 695
 aaa ttc ttc ccc agc agc tca tac aga ara cca gtc gga att tct agt 2163
 Lys Phe Phe Pro Ser Ser Ser Tyr Arg Xaa Pro Val Gly Ile Ser Ser
 700 705 710
 atg gtt gag gcc atg gtg tcc agg gcc cgc att gat gca cga att gac 2211
 Met Val Glu Ala Met Val Ser Arg Ala Arg Ile Asp Ala Arg Ile Asp
 715 720 725
 ttc gaa tct gga cgg ata aag aag gat gag ttc gct gag atc atg aag 2259
 Phe Glu Ser Gly Arg Ile Lys Lys Asp Glu Phe Ala Glu Ile Met Lys
 730 735 740 745
 atc tgt tcc acc att gaa gag ctc aga cgg caa aaa tagtgaattt 2305
 Ile Cys Ser Thr Ile Glu Glu Leu Arg Arg Gln Lys
 750 755
 agcttgatct tcgtgaaaaa atgccttggt tctact 2341

<210> 107

<211> 757

<212> PRT

<213> Equine influenza virus H3N8

<220>

<221> misc_feature

<222> (707)..(707)

<223> The 'Xaa' at location 707 stands for Arg, or Lys.

<400> 107

Met Asp Val Asn Pro Thr Leu Leu Phe Leu Lys Val Pro Ala Gln Asn
 1 5 10 15

Ala Ile Ser Thr Thr Phe Pro Tyr Thr Gly Asp Pro Pro Tyr Ser His
 20 25 30

Gly Thr Gly Thr Gly Tyr Thr Met Asp Thr Val Asn Arg Thr His Gln
 35 40 45

Tyr Ser Glu Lys Gly Lys Trp Thr Thr Asn Thr Glu Ile Gly Ala Pro

50

55

60

Gln Leu Asn Pro Ile Asp Gly Pro Leu Pro Glu Asp Asn Glu Pro Ser
65 70 75 80

Gly Tyr Ala Gln Thr Asp Cys Val Leu Glu Ala Met Ala Phe Leu Glu
85 90 95

Glu Ser His Pro Gly Ile Phe Glu Asn Ser Cys Leu Glu Thr Met Glu
100 105 110

Val Val Gln Gln Thr Arg Val Asp Lys Leu Thr Gln Gly Arg Gln Thr
115 120 125

Tyr Asp Trp Thr Leu Asn Arg Asn Gln Pro Ala Ala Thr Ala Leu Ala
130 135 140

Asn Thr Ile Glu Val Phe Arg Ser Asn Asp Leu Thr Ser Ser Glu Ser
145 150 155 160

Gly Arg Leu Met Asp Phe Leu Lys Asp Val Met Glu Ser Met Asn Lys
165 170 175

Glu Glu Met Glu Ile Thr Thr His Phe Gln Arg Lys Arg Arg Val Arg
180 185 190

Asp Asn Met Thr Lys Arg Met Val Thr Gln Arg Thr Ile Gly Lys Lys
195 200 205

Lys Gln Arg Leu Asn Arg Lys Ser Tyr Leu Ile Arg Ala Leu Thr Leu
210 215 220

Asn Thr Met Thr Lys Asp Ala Glu Arg Gly Lys Leu Lys Arg Arg Ala
225 230 235 240

Ile Ala Thr Pro Gly Met Gln Ile Arg Gly Phe Val Tyr Phe Val Glu
245 250 255

Thr Leu Ala Arg Arg Ile Cys Glu Lys Leu Glu Gln Ser Gly Leu Pro
260 265 270

Val Gly Gly Asn Glu Lys Lys Ala Lys Leu Ala Asn Val Val Arg Lys
275 280 285

EQ-1-C2-1.ST25.txt

Met Met Thr Asn Ser Gln Asp Thr Glu Leu Ser Phe Thr Ile Thr Gly
 290 295 300

Asp Asn Thr Lys Trp Asn Glu Asn Gln Asn Pro Arg Met Phe Leu Ala
 305 310 315 320

Met Ile Thr Tyr Ile Thr Arg Asn Gln Pro Glu Trp Phe Arg Asn Val
 325 330 335

Leu Ser Ile Ala Pro Ile Met Phe Ser Asn Lys Met Ala Arg Leu Gly
 340 345 350

Lys Gly Tyr Met Phe Glu Ser Lys Ser Met Lys Leu Arg Thr Gln Ile
 355 360 365

Pro Ala Glu Met Leu Ala Ser Ile Asp Leu Lys Tyr Phe Asn Asp Ser
 370 375 380

Thr Lys Lys Lys Ile Glu Lys Ile Arg Pro Leu Leu Val Asp Gly Thr
 385 390 395 400

Ala Ser Leu Ser Pro Gly Met Met Met Gly Met Phe Asn Met Leu Ser
 405 410 415

Thr Val Leu Gly Val Ser Ile Leu Asn Leu Gly Gln Arg Lys Tyr Thr
 420 425 430

Lys Thr Thr Tyr Trp Trp Asp Gly Leu Gln Ser Ser Asp Asp Phe Ala
 435 440 445

Leu Ile Val Asn Ala Pro Asn His Glu Gly Ile Gln Ala Gly Val Asp
 450 455 460

Arg Phe Tyr Arg Thr Cys Lys Leu Val Gly Ile Asn Met Ser Lys Lys
 465 470 475 480

Lys Ser Tyr Ile Asn Arg Thr Gly Thr Phe Glu Phe Thr Ser Phe Phe
 485 490 495

Tyr Arg Tyr Gly Phe Val Ala Asn Phe Ser Met Glu Leu Pro Ser Phe
 500 505 510

Gly Val Ser Gly Ile Asn Glu Ser Ala Asp Met Ser Ile Gly Met Thr
 515 520 525

EQ-1-C2-1.ST25.txt

Val Ile Lys Asn Asn Met Ile Asn Asn Asp Leu Gly Pro Ala Thr Ala
 530 535 540

Gln Met Ala Leu Gln Leu Phe Ile Lys Asp Tyr Arg Tyr Thr Tyr Arg
 545 550 555 560

Cys Gln Arg Gly Asp Thr Gln Ile Gln Thr Arg Arg Ser Phe Glu Leu
 565 570 575

Lys Lys Leu Trp Glu Gln Thr Arg Ser Lys Thr Gly Leu Leu Val Ser
 580 585 590

Asp Gly Gly Pro Asn Leu Tyr Asn Ile Arg Asn Leu His Ile Pro Glu
 595 600 605

Val Cys Leu Lys Trp Glu Leu Met Asp Glu Asp Tyr Lys Gly Arg Leu
 610 615 620

Cys Asn Pro Leu Asn Pro Phe Val Ser His Lys Glu Ile Glu Ser Val
 625 630 635 640

Asn Ser Ala Val Val Met Pro Ala His Gly Pro Ala Lys Ser Met Glu
 645 650 655

Tyr Asp Ala Val Ala Thr Thr His Ser Trp Ile Pro Lys Arg Asn Arg
 660 665 670

Ser Ile Leu Asn Thr Ser Gln Arg Gly Ile Leu Glu Asp Glu Gln Met
 675 680 685

Tyr Gln Lys Cys Cys Asn Leu Phe Glu Lys Phe Phe Pro Ser Ser Ser
 690 695 700

Tyr Arg Xaa Pro Val Gly Ile Ser Ser Met Val Glu Ala Met Val Ser
 705 710 715 720

Arg Ala Arg Ile Asp Ala Arg Ile Asp Phe Glu Ser Gly Arg Ile Lys
 725 730 735

Lys Asp Glu Phe Ala Glu Ile Met Lys Ile Cys Ser Thr Ile Glu Glu
 740 745 750

Leu Arg Arg Gln Lys
 755

<210> 108
 <211> 2271
 <212> DNA
 <213> Equine influenza virus H3N8

<400> 108
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 acattccctt atactggaga tcttccttac agtcatggaa cagggacagg atacaccatg 120
 gatactgtca acagaacaca tcaatactca gaaaagggga aatggacaac aaacactgag 180
 attggagcac cacaacttaa tccaatcgat ggaccgcttc ctgaagacaa tgaaccaagt 240
 gggtagcggc aaacagattg tgtattggaa gcaatggctt tccttgaaga atcccatccc 300
 ggaatccttg aaaattcgtg tcttgaaaca atggaggtgg ttcagcagac aagagtggac 360
 aaactaacac aaggccgaca aacttacgat tggaccttga ataggaatca acctgccgca 420
 acagcacttg ctaatacaat tgaagtgttc agatcaaata atctgacttc cagtgaagtca 480
 gggagattaa tggacttcct caaagatgtc atggagtcca tgaacaagga agaaatggaa 540
 ataacaacac acttccaacg gaagagaaga gtaagagaca acatgacaaa gagaatgggtg 600
 acacagagaa ccatagggaa gaaaaaaca cgattaaaca gaaagagcta tctgatcagg 660
 gcattaacct taaacacaat gaccaaggac gctgagagag ggaaattgaa acgacgagca 720
 attgcaaccc caggaatgca gataagaggg tttgtatatt ttgttgaaac attagcccgga 780
 agaatatgtg aaaagcttga acaatcagga ttgccagttg gcggtaatga gaaaaaggcc 840
 aaactggcta atgtcgtcag aaaaatgatg actaattccc aagacactga actctccttc 900
 accatcactg gggacaatac caaatggaat gaaaatcaga acccacgcat gttcctggca 960
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EQ-1-C2-1.ST25.txt

gcagacatga gcattggaat gacagttatc aaaaacaaca tgataaataa tgatctcggt	1620
cccgccacgg cacaatggc actccaactc ttcattaagg attatcggta cacataccgg	1680
tgtcaaagag gcgataccca gatacaaacc agaagatcct ttgagttgaa gaaactgtgg	1740
gaacagactc gatcaaagac tgggtctactg gtatcagatg ggggtccaaa cctatacaac	1800
atcagaaaacc tacacatccc ggaagtctgt ttgaaatggg agctgatgga tgaagattat	1860
aaagggaggc tatgtaatcc attgaatcct ttcgttagcc acaaagaaat tgaatcagt	1920
aacagtgcag tagtaatgcc tgcgcattggc cctgccaaaa gcatggagta tgatgctgtt	1980
gcaacaacac actcttggat cccaagagg aaccgggtcca tattgaacac aagtcaaagg	2040
ggaatactcg aagatgagca gatgtatcag aaatgctgca acctgtttga aaaattcttc	2100
cccagcagct catacagaar accagtcgga atttctagta tggttgaggg catgggtgtcc	2160
agggcccgca ttgatgcacg aattgacttc gaatctggac ggataaagaa ggatgagttc	2220
gctgagatca tgaagatctg ttccaccatt gaagagctca gacggcaaaa a	2271